Department of Primary Industries
Office of Water

NSW Reference Rates Manual

Valuation of water supply, sewerage and stormwater assets

www.dpi.nsw.gov.au

Publisher: Department of Primary Industries, a division of NSW Department of Trade and Investment, Regional Infrastructure and Services

Title: NSW Reference Rates Manual - Valuation of Water Supply, Sewerage and Stormwater Assets

First published June 2014

ISBN 978 1 74256 646 7

NSW Office of Water

Level 18, 227 Elizabeth Street

GPO Box 3889

Sydney NSW 2001

T 02 8281 7777 F 02 8281 7799

information@water.nsw.gov.au

www.water.nsw.gov.au

Compiling editors:

Sam Samra, Senior Manager, Water Utility Performance

Maree Abood, Director, Urban Water

BEST PRACTICE MANAGEMENT

NSW Office of Water, June 2014

Foreword

This *2014 Reference Rates Manual for Valuation of Water Supply, Sewerage and Stormwater Assets* updates the 2003 edition of the manual and was prepared by the Urban Water branch of the NSW Office of Water. NSW Local Water Utilities are required to determine the fair value[1] and current replacement cost depreciation for their water supply, sewerage and stormwater assets in accordance with this Manual.

The Reference Rates shown are for June 2014 and are based on competitive contract prices obtained by NSW Public Works for water supply and sewerage projects within NSW, supplemented by published rates for water supply, sewerage and stormwater works and also rates obtained from a number of LWUs and other agencies.

[1] Valuations are on a MEERA – Modern Engineering Equivalent Replacement Asset basis.

Acknowledgements

The NSW Office of Water[2] acknowledges NSW Public Works, Goldenfields Water County Council, Gosford City Council and Tweed Shire Council for providing contract information for water supply and sewerage projects, Landcom, Roads and Maritime Services, Fairfield and Shoalhaven City Councils, for providing cost data for stormwater assets.

An advance copy of the manual was distributed for comment to a representative group of LWUs and to industry groups. Valuable comments provided by the following are acknowledged: Local Government NSW (LGNSW), the NSW Water Industry Directorate, Albury City Council, Clarence Valley Council, Cootamundra Shire Council, Dubbo City Council, Goldenfields Water County Council, Leeton Shire Council, Orange City Council, Lismore City Council, Riverina Water County Council, Shoalhaven City Council, Tumut Council, Wagga Wagga City Council, Hydroscience Consulting and NSW Public Works.

[2] The NSW Office of Water is responsible for managing the NSW Government's *Country Towns Water Supply and Sewerage (CTWSS) Program* (www.water.nsw.gov.au), which is a major reform Program. The Office of Water oversees and monitors utility performance, provides leadership, guidance, software and training to the utilities and is the primary regulator for the 105 regional LWUs.

Abbreviated Contents

Contents

Figures

Tables

Abbreviations

AC	Asbestos Cement
CI	Cast Iron
CICL	Cast Iron Cement Lined
CPI	Consumer Price Index
DIA	Diameter
DICL	Ductile Iron Cement Lined
EA	Extended Aeration
EP	Equivalent Persons
FRC	Fibre Reinforced Cement
IDEA	Intermittent Decanted Extended Aeration
GST	Goods and Services Tax
kW	Kilowatt
L/s	Litres per second
M	Million
m	Metre
MBR	Membrane Bioreactor – sewage treatment works
MEERA	Modern Engineering Equivalent Replacement Asset
ML	Megalitre
M & E	Mechanical and Electrical
NOW	NSW Office of Water
NWI	National Water Initiative
O & M	Operation and Maintenance
OTR	Other Than Rock
PVC	Polyvinyl Chloride
RC	Reinforced Concrete
RCP	Reinforced Concrete Pipe
SID	Survey, Investigation, Design and Project Management
uPVC	Unplasticised Polyvinyl Chloride
UV	Ultra-violet irradiation
VC	Vitrified Clay

1. Executive Overview

1.1. Best-Practice Management Framework

The NSW Government's *Best-Practice Management of Water Supply and Sewerage Framework* (page 4) has been developed as a practical means of implementing the Goal of the Government's Country Towns Water Supply and Sewerage Program[3]. The Framework[4] is the key driver for reform of planning, pricing and management for continuing productivity improvement by each utility. It consolidates earlier initiatives and involves 6 elements:

- Integrated Water Cycle Management
- Strategic business planning and financial planning
- Pricing and regulation of water supply, sewerage and trade waste (including pay-for-use water pricing, strong pricing signals, full cost recovery, commercial sewer usage, trade waste and developer charges and a trade waste regulation policy).
- Water conservation and demand management
- Drought management
- Annual performance monitoring[5] – including annual
  - Performance Monitoring Report – Statewide performance and key performance indicators
  - Benchmarking Report – benchmarking data and performance trends over the last 6 years
  - 2-page triple bottom line (TBL) Performance Report from the NSW Office of Water for each utility and
  - Action Plan by each utility.

The outcome of a local water utility (LWU) implementing the 19 requirements of the *Best-Practice Management Guidelines* is appropriate[6], affordable and cost-effective[7] services to meet community needs while protecting public health and the environment.

Utilities which have implemented the requirements of the *NSW Best-Practice Management Framework* have also implemented the 9 national requirements shown in Figure 1 on page 4.

1.2. Purpose of Reference Rates Manual

This 2014 Reference Rates Manual updates the 2003 edition of the manual and has been prepared by the Urban Water branch of the NSW Office of Water. LWUs are required to determine the fair value[8] of their water supply, sewerage and stormwater assets in accordance with this Manual.

---

3 Appropriate, affordable and cost-effective water supply and sewerage services in urban areas of regional NSW which meet community needs and protect public health and the environment.

4 The Framework is based on the *Best-Practice Management of Water Supply and Sewerage Guidelines, 2007* (available at www.water.nsw.gov.au).

5 Refer to Section 14 and Appendix G of NSW Water & Sewerage Strategic Business Planning Guidelines, July 2011 (available at www.water.nsw.gov.au).

6 Ie. fit for purpose, without wasteful 'gold plating'.

7 Effective and efficient services including appropriate use of modified standards for small communities, eg. National Handbook on Affordable Water Supply and Sewerage for Small Communities, ARMCANZ/WSAA, 1999.

8 Valuations are on a MEERA - Modern Engineering Equivalent Replacement Asset basis.

In accordance with the Australian Accounting Standards Board's AASB116 Property, Plant and Equipment, infrastructure assets are to be valued at fair value. It is noted that there are no material practical differences

The manual was first published in June 2003 and since that time the Office of Water has published an annual update of Attachment 1 on page 62 to reflect changes in the construction cost index due to inflation and also to reflect changes in the construction industry. However, together with these annual changes, there have also been substantial changes in the prices for some of the infrastructure included in the manual (note 2 on page 10). This 2014 Manual has been prepared to reflect these price movements.

The Reference Rates shown are based on competitive contract prices obtained by NSW Public Works for water supply and sewerage projects within NSW, supplemented by published rates for water supply, sewerage and stormwater works and also rates obtained from a number of LWUs and other agencies (page ii).

The manual will assist NSW LWUs in implementing two requirements:

(1) Determining the fair value and current replacement cost depreciation for their water supply, sewerage and stormwater assets. These must be reported in each LWU's annual financial statements, including Special Schedule Nos 3 to 6[9,10].

(2) As part of best-practice management of water & sewerage businesses each LWU is required to prepare a 20 to 30-year capital works program as part of its strategic business plan[11].

These requirements involve estimating the capital cost of existing and future water supply, sewerage and stormwater assets on a MEERA[8] basis.

The Reference Rates in this manual apply to the capital cost of works such as pipelines, service reservoirs, pumping stations and treatment works but not to works such as dams, weirs, river intakes, tunnels and outfalls where the cost is dependant on the particular site. For these site-specific works a separate valuation would be required, as discussed in section 2.8 on page 9.

Page 74 of the Division of Local Government's Planning and Reporting Manual 2010 identifies the asset management planning requirements for water supply and sewerage:

> 'There are specific asset management planning requirements for water supply and sewerage. They require compliance with the *Best-Practice Management of Water Supply and Sewerage Guidelines 2007* and the *NSW Reference Rates Manual for Valuation of Water Supply, Sewerage and Stormwater Assets*. Further guidance for councils is provided in the *Water Supply and Sewerage Asset Management Guidelines*[12] *1991.*
>
> These requirements include the need to prepare an Asset Register, a 20 to 30 year Operation Plan, Maintenance Plan and a Capital Works Plan which identifies the required renewals, works for improved levels of service and works for serving new growth. Councils must continue to meet these asset management planning requirements for their water supply and sewerage infrastructure.'

between fair value and deprival value in the valuation of physical non-current assets such as water supply, sewerage and stormwater drainage (refer to Appendix E of Accounting Policy: Valuation of Physical Non-Current Assets at Fair Value, tpp 07-1, NSW Treasury, April 2007 (available at www.treasury.nsw.gov.au)). Note although tpp 07-1 has been amended by Treasury Circulars NSW TC 12/05 and 10/07, the amendments do not affect Appendix E of the Accounting Policy.

9 *Local Government Code of Accounting Practice and Financial Reporting*, Division of Local Government, NSW Department of Premier and Cabinet, June 2013 (available at www.dlg.nsw.gov.au).

10 It is important to note that all 30 National Water Initiative (NWI) financial performance indicators are independently audited annually for each NSW local water utility. These are reported in Notes 2 and 3 of the Special Purpose Financial Reports to each LWU's annual financial statements.

11 NSW Water and Sewerage Strategic Business Planning Guidelines, NSW Office of Water, 2011 (available at www.water.nsw.gov.au).

12 Updated guidance is available in Section 10 of the above Strategic Business Planning Guidelines.

1.3. Use of Reference Rates for Existing Assets

To obtain the fair value of assets, the current replacement cost using the Reference Rates should be reduced to reflect the portion of the useful life of the asset that has been used up. Attachment 2 on page 64 provides typical useful lives for water and sewerage assets[13]. It is expected that these would be used for calculating the fair value and the current replacement cost depreciation[14] of assets, except for assets where the LWU has prepared detailed estimates of useful life. Similarly, where a LWU has access to suitable recent contract prices, it is encouraged to use such local data for its valuations.

The Reference Rates quoted are estimates for June 2014 valuation of the capital cost of existing assets, and exclude contingencies and the Goods and Services Tax (GST).

LWUs are required to annually index their asset values in the years between full revaluations using the annual construction cost index shown on page 62 of Attachment 1. Such annual indexing is necessary in order to avoid understating asset values[15] and depreciation. The NSW Office of Water will continue to update Attachment 1 annually.

1.4. Use of Reference Rates for Future Works

The Reference Rates are also suitable for estimating the capital cost of future works, where specific cost estimates are not available - eg. in the early stages of a project, before completion of investigation reports and concept designs. For such future works, LWUs must add an appropriate contingency amount to the Reference Rates in accordance with section 2.5 on page 7.

A more detailed estimate would normally be warranted at the concept or detailed design stage. Such an estimate would also take account of the prevailing market conditions. These Reference Rates may be used for estimating the capital cost of assets required to service new development, in which case the contingency amount may not exceed 20%.

1.5. Related Publications

This manual complements other guidelines published[16] by the NSW Office of Water including:

- Best Practice Management of Water Supply and Sewerage Guidelines, 2007;
- NSW Water and Sewerage Strategic Business Planning Guidelines, 2011;
- Liquid Trade Water Regulation Guidelines, 2009;
- 2012-13 NSW Water Supply and Sewerage Performance Monitoring Report[17]; and
- 2012-13 NSW Water Supply and Sewerage Benchmarking Report.

Other guidelines proposed to be updated by the NSW Office of Water in 2014 are:

- NSW Water and Sewerage Community Involvement Guidelines; and
- FINMOD User Manual[18].

[13] Including relined water mains and relined sewerage mains.

[14] Refer to note 10 on page 21 in regard to the depreciation of sewer mains.

[15] Such understating of asset values and depreciation may lead to failure to fully recover costs as required by National Competition Policy and the NSW Best-Practice Management Framework (page 4).

[16] Available at www.water.nsw.gov.au.

[17] Other software, guidelines and training for LWUs developed by the NSW Office of Water are shown on page 15 of the *2012-13 NSW Water Supply and Sewerage Performance Monitoring Report.*

[18] The NSW Office of Water will continue to provide the FINMOD User Manual to all licensed users of the FINMOD software (NSW Financial Planning Model).

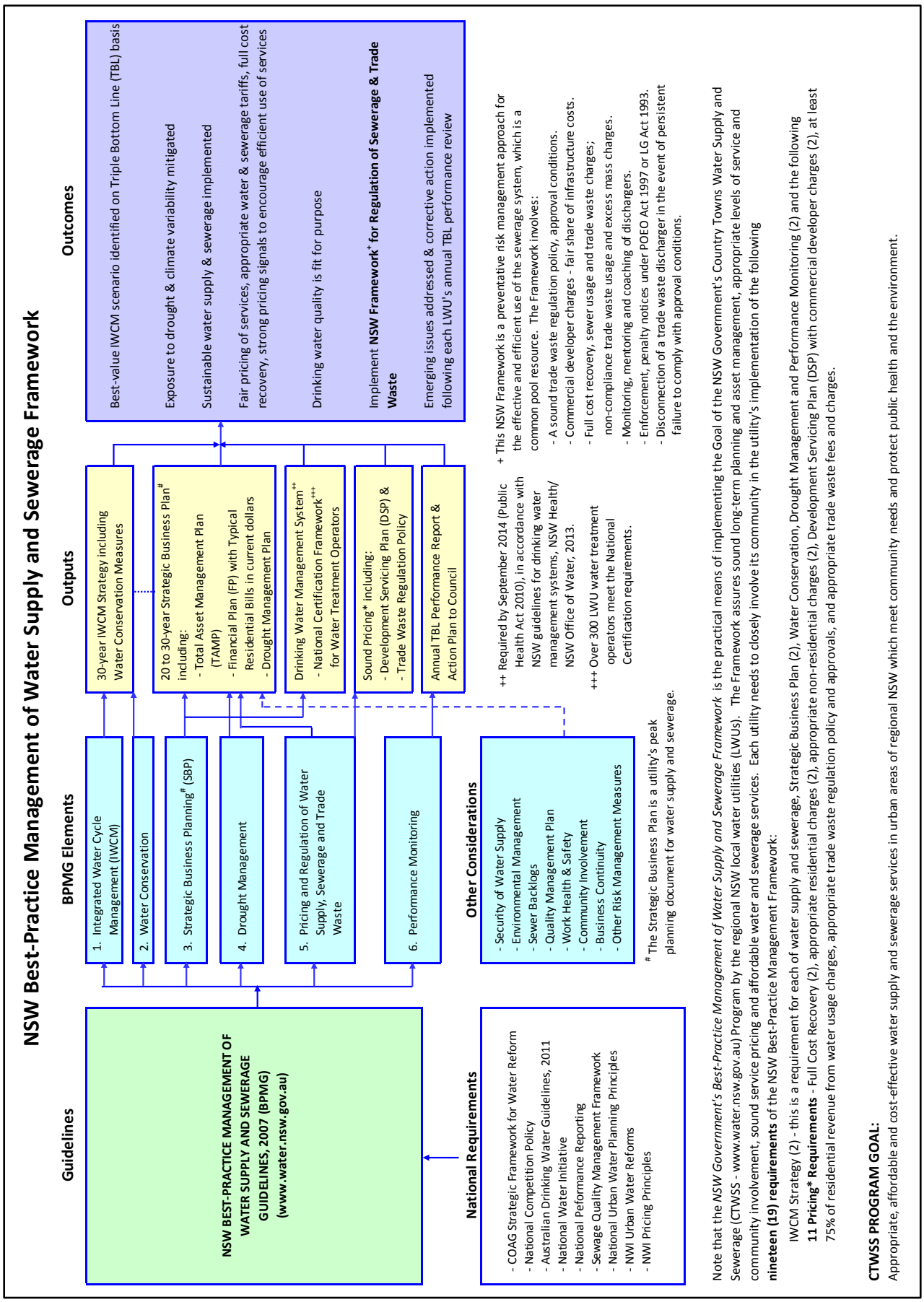

Figure 1 NSW Best-Practice Management of Water Supply and Sewerage Framework

2. Basis of Reference Rates

2.1. General

The sources used to determine the 2014 Reference Rates shown in this manual are competitive contract prices obtained by NSW Public Works for water supply, sewerage and stormwater projects within NSW together with data obtained from Local Water Utilities (LWUs) and other NSW agencies, supplemented by published rates where available for water supply, sewerage and stormwater works. Sources of rates are acknowledged on page ii.

The Reference Rates Tables included in this manual are listed in section 3 on page 10. The tables show both the contract rate and the reference rate for the capital cost of the following assets:

WATER SUPPLY (page 11)

- Water Mains
- Water Pumping Stations (Distribution)
- Water Treatment Works
- Service Reservoirs

SEWERAGE (page 21)

- Sewer Mains
- Sewage Pumping Stations
- Sewage Treatment Works

STORMWATER (page 36)

- Stormwater Mains
- Stormwater Pits
- Stormwater Culverts

2.2. Reference Rates

The Reference Rates are made up of a "**Contract Rate**", plus allowance for **SID** (survey, investigation, design and project management) for the capital cost of each asset. Contingencies are not included.

- **Contract Rate** - the prime cost to construct the asset determined from prices obtained from competitive tenders (section 2.3 on page 6), plus
- **SID** - a percentage increase to be applied to the Contract Rate to allow for survey, investigation, design and project management (section 2.4 on page 6).

As indicated in section 1.4 on page 3, a contingency amount should be added to the Reference Rates in preparing cost estimates for future works (section 2.5 on page 8). However, as contingencies are considered to be not warranted for the valuation of existing assets, they are not included in the Reference Rates (page 8).

Figures showing the Contract Rates for the capital cost of each facility (ie. **excluding** SID) versus key characteristics, such as storage capacity for a service reservoir are also provided in section 5 on page 45. These figures have been determined by drawing a curve of best fit through the available data points. The curve was then used as the basis for determining the Contract Rates and the Reference Rates (which **include** SID) presented in the tables shown in section 3 on page 10.

As noted above, the Reference Rates are a 'general' guide covering the whole of NSW and have been determined from a generalised curve fitted through the available data points. For some assets the range of available prices is large and therefore the Reference Rates should be applied with caution, with due allowance for local or site-specific conditions and for specific projects. As noted in section 1.3 on page 3, where a LWU has access to suitable recent contract prices, it is encouraged to use such local data for its valuations.

2.3. Contract Rates

The "**Contract Rate**" is the estimated prime cost for constructing an asset. It is based on competitive contract prices obtained by NSW Public Works for water supply, sewerage and stormwater projects within NSW, together with data obtained from Local Water Utilities (LWUs) and other NSW agencies, supplemented by published rates where available for water supply, sewerage and stormwater works.

It is important to note that only data from **substantial contracts** (eg. those with long lengths of pipe consisting of several kilometres of mains) have been used to compile these rates. The rates shown in the following tables **do not apply to minor works** (eg. short lengths of mains renewals).

The Contract Rate is an “all up" rate which includes some allowance for ancillary works associated with the asset (eg. the rate for sewer reticulation includes an allowance for access chambers (or maintenance holes), sidelines, sewer risers and road crossings). However significant additional costs may need to be added to allow for assets with unusual construction difficulty, rock excavation or for unusual contracts including dewatering etc. These are explained in section 2.7 on page 8.

The Contract Rates **do not** include operation or maintenance costs.

2.4. Survey, Investigation, Design & Project Management (SID)

The Survey, Investigation, Design and Project Management (SID) component of a project varies with the complexity, size and the technology involved in the project. A complex project or a project with "state of the art" technology will require greater inputs both in design and management than a conventional project.

The SID component can vary from 5% to 20% and some typical SID allowances are shown below:

- Water and sewerage mains 10%
- Service reservoirs, pumping stations 15%
- Water or sewage treatment works 20%

A suggested value for the SID component is provided in the notes below the Table of rates for each type of asset.

2.5. Contingencies

Contingencies are required to allow for risk or uncertainty in the estimate. Uncertainty can be due to inherent risk (uncertainty in the scope of work and uncertainty in the estimated cost of the assets within the scope of work) or contingent risk (uncertainty due to additional costs which are beyond the control of the designer or constructor).

Inherent risk is dependent on the type of asset and also the stage at which the estimate is undertaken. It will be higher at earlier stages (eg. feasibility) where there is less definition of the scope of works and costs must be applied with less knowledge of unknowns (eg. site conditions). Inherent risk includes the following:

- Uncertainty in the scope of work. There will be greater uncertainty at earlier stages in design, where there is only a broad outline of the scope of work. This will result in a greater uncertainty in the quantities.
- Uncertainty in the costs to be applied. A complex or high tech asset will generally have greater uncertainty in the costs. Also, at earlier stages of design, costing will necessarily be an “all up rate” with less detail known of the assets involved which will result in a greater uncertainty.
- Uncertainty in site conditions (eg. unexpected rock, groundwater or other services). This will be greater at earlier stages where less investigation has been carried out.

It is suggested that the following approximate percentages may be suitable for inherent risk.

- Feasibility stage - 30%,
- Concept design stage - 20%,
- Preliminary design stage - 15%,
- Detailed design stage - 10%.

However, the primary purpose of this manual is for valuation of existing assets and for this case it is considered reasonable to assume that the inherent risk is zero (ie. the scope of works is accurately defined and the estimated asset costs are within acceptable limits).

Contingent risk (factors beyond the control of the designers or constructors). These include:

- industrial issues;
- adverse weather;
- availability of labour and materials; and
- extensions of time due to unforeseen construction problems or site conditions;

The percentage to be applied for contingent risk is dependent on each site and the conditions prevailing at the time.

Existing Assets – a contingency allowance is not warranted as it is considered that both the inherent risk and the contingent risk for such assets are minimal. No contingency allowance has therefore been included in the Reference Rates.

Future Assets – a contingency allowance should be included in accordance with the above and section 1.4 on page 3. The contingency allowance for future works required within 10 years must not exceed 20 per cent. The Reference Rates should be increased by adding the above contingency allowance to the Reference Rates.

2.6. Estimates Based on these Reference Rates

The Reference Rates shown in this manual have been determined by multiplying the Contract Rates by a factor corresponding to the allowance for SID (eg. 1.15 for 15% SID). The Reference Rates have then been rounded to an appropriate number.

These Reference Rates are intended for valuation of existing assets. For the valuation of future works, a contingency amount should be added to the Reference Rates in accordance with section 1.4 on page 3 and section 2.5 on page 7.

The Reference Rates for water supply, sewerage and stormwater mains shown in this manual may also need to be increased to allow for construction difficulty, rock excavation or other factors as indicated in section 2.7.

It should be noted that the Reference Rates are a 'general' guide covering the whole of NSW. They should be applied with due allowance for local and site-specific conditions and for specific projects. Refer also to section 1.3 on page 3.

The capital cost estimates for some projects (eg. treatment works, pumping stations and service reservoirs) may also need to include the cost of additional factors such as:

- land acquisition
- provision of power and data connections to remote sites
- access roads
- significant environmental constraints
- fencing and landscaping

These latter factors are **not included** in the rates provided in this manual.

2.7. Additional Costs for Rock Excavation and Construction Difficulty

The Reference Rates for **water mains, sewer mains and stormwater mains** in this manual are for "normal" conditions (ie. typical residential areas). Where the mains are constructed in congested urban areas (eg. town centres) or where there is rock or groundwater, additional costs may be required. These additional costs arise from factors such as:

- Rock excavation
- Construction difficulty including

  - traffic control
  - congestion/relocation of existing services
  - restricted access
  - special compaction and restoration under roads
  - particular environmental requirements
- Dewatering

These factors, particularly construction difficulty, can add significantly to the capital cost of the water, sewer or stormwater main and should be considered carefully. A guide to these additional costs is given in Table 17 on page 35.

2.8. Site-Specific Works

Valuation of site-specific water supply works such as dams, weirs and tunnels are heavily dependent on the type of asset (eg. type of dam) and the particular site conditions. In addition, the impact of new technology may affect the type and cost of the asset. For example, a concrete gravity dam or an embankment dam may be replaced at lower cost by a roller compacted concrete dam.

Similarly, provision should be made for site-specific **stormwater** works such as flood retarding basins, gross pollutant traps or wetlands.

It is suggested that generally the asset be valued as described in (a) below. However, as upgrading or replacement of the asset becomes imminent, a more detailed estimate will be warranted. The suggested valuation process is as follows:

(a) Generally it would be reasonable to estimate the current cost of the asset by indexing the historic capital cost of the asset using the construction cost indices in Attachment 1 on page 62. Alternatively, where a more detailed estimate is warranted, a valuation can be carried out as indicated for (b) below.

(b) When upgrading or replacement of the works becomes imminent, the valuation should be based on a conceptual design for the works providing the required service, using up to date technology and current unit rates.

3. Reference Rates Tables

Reference Rates for the valuation of water supply, sewerage and stormwater assets are shown in the following Tables:

GENERAL NOTES

1. The rates shown are for June 2014 valuation of the capital cost of existing assets and exclude contingencies and the GST. A suitable percentage for contingencies must be included for valuation of new works (section 2.5 on pages 7 and 8).
2. The 2014 rates for water, sewer and stormwater mains (Tables 1, 2, 9 and 18), water treatment works (Table 5), pumping stations (Tables 4 and 10), service reservoirs (Table 8) and stormwater culverts (Table 20) have increased significantly more than the capital cost inflation rate since 2003. However, there has not been a significant increase in the real cost of most other assets (larger steel mains (Table 3), most elements of sewage treatment works (Tables 11 to 16) and stormwater pits (Table 19)). Capital Cost Indices are shown in Attachment 1 (page 62). A guide to the increases since 2003 is shown in the notes for each table.
3. Contract Rate is the prime cost for construction of the asset based on competitive contract prices.
4. Reference Rate = Factor for SID x Contract Rate (ie. no contingencies - refer to section 2.5 on page 7). For Contract Rates and SID, refer to sections 2.3 and 2.4 on page 6.

Table 1 Water Mains – uPVC

(See also Table 17 on page 35 for additional costs)

	Diameter *(mm)*	***Contract Rate*** *($/m) 2014*	***Reference Rate*** *($/m) 2014*
Reticulation uPVC	**50**	56	62
	80	73	80
	100	86	95
	150	127	140
	200	173	190
	250	227	250
	300	291	320
	375	382	420
Trunk Mains uPVC	**80**	62	68
	100	77	85
	150	105	115
	200	145	160
	250	182	200
	300	227	250
	375	336	370

NOTES

1. These rates are for June 2014 valuation of the capital cost of existing assets and exclude contingencies and the GST. A suitable percentage for contingencies must be included (section 2.5 on page 8) for valuation of new works.
2. Review of recent contracts shows that the rates for uPVC trunk mains and reticulation mains have **increased** by about **20%** above the capital cost inflation rate since 2003. These increases are not uniform over all size ranges.
3. Reference Rate = 1.10 x Contract Rate (ie. Contract Rate plus SID of 10%).
4. Caution: Additional costs apply for mains constructed in congested urban areas (eg. in town centres), in rock or where dewatering is required (refer Table 17 on page 35).
5. The rates allow for pipe supply, excavate, lay, backfill, restoration, fittings and thrust blocks.
6. "Reticulation" rates include an allowance for service connections, isolating valves, hydrants and restoration for typical urban reticulation.
7. "Trunk main" rates include air valves, scour valves and isolating valves.
8. Excavation is in OTR and pipelines are laid to minimum depth.
9. Pipe material is uPVC Class 12 (for mPVC mains assume 7% reduction in capital cost).
10. Existing mains of materials that are no longer used should be valued on the basis of replacement assets (ie. AC mains can be valued as uPVC mains).

Table 2 Water Mains - DICL

(See also Table 17 on page 35 for additional costs)

	Diameter *(mm)*	***Contract Rate*** *($/m) 2014*	***Reference Rate*** *($/m) 2014*
Reticulation DICL	**100**	145	160
	150	182	200
	200	227	250
	250	264	290
	300	309	340
	375	391	430
Trunk Mains DICL	**100**	91	100
	150	136	150
	200	173	190
	250	209	230
	300	264	290
	375	355	390
	450	464	510
	500	536	590
	600	682	750
	750	910	1 000

NOTES

1. These rates are for June 2014 valuation of the capital cost of existing assets and exclude contingencies and the GST. A suitable percentage for contingencies must be included (section 2.5 on page 8) for valuation of new works.
2. Review of recent contracts shows that the rates for DICL reticulation mains have increased by about 15% above the capital cost inflation rate since 2003, while the rate for DICL trunk mains has increased above the inflation rate by about 10% for mains up to 250mm, about 25% for 300mm to 450mm and up to 45% for larger mains. These increases are not uniform over all size ranges.
3. Reference Rate = 1.10 x Contract Rate (ie. Contract Rate plus SID of 10%).
4. Caution: Additional costs apply for mains constructed in congested urban areas (eg. in town centres), in rock or where dewatering is required (refer Table 17 on page 35).
5. The rates allow for pipe supply, excavate, lay, backfill, restoration, fittings and thrust blocks.
6. "Reticulation" rates include an allowance for service connections, isolating valves, hydrants and restoration for typical urban reticulation.
7. "Trunk main" rates include air valves, scour valves and isolating valves.
8. Excavation is in OTR and pipelines are laid to minimum depth.
9. Pipe materials are DICL Class K9.
10. Existing mains of materials that are no longer used should be valued on the basis of replacement assets. CI or CICL mains can be valued as DICL mains.

Table 3 Water Mains - Steel

(See also Table 17 on page 35 for additional costs)

	Diameter *(mm)*	***Contract Rate*** *($/m) 2014*	***Reference Rate*** *($/m) 2014*
Trunk Mains Steel	***300***	400	440
	375	509	560
	450	591	650
	500	655	720
	600	782	860
	750	955	1 050
	900	1 180	1 300
	1 050	1 500	1 650
	1 200	1 770	1 950

NOTES

1. These rates are for June 2014 valuation of the capital cost of existing assets and exclude contingencies and the GST. A suitable percentage for contingencies must be included (section 2.5 on page 8) for valuation of new works.
2. Review of recent contracts shows that the rates for steel trunk mains have **increased** by about **50%** above the capital cost inflation rate since 2003 for mains **up to 600mm**. The increase for 900mm to 1200mm mains was about 5% above the inflation rate. These increases are not uniform over all size ranges.
3. Reference Rate = 1.10 x Contract Rate (ie. Contract Rate plus SID of 10%).
4. Caution: Additional costs apply for mains constructed in congested urban areas (eg. in town centres), in rock or where dewatering is required (refer Table 17 on page 35).
5. The rates allow for pipe supply, excavate, lay, backfill, restoration, fittings and thrust blocks.
6. The rates include air valves, scour valves and isolating valves.
7. Excavation is in OTR and pipelines are laid to minimum depth.
8. Pipe materials are steel mains with generally minimum plate thickness.
9. For valuation of existing steel mains in sizes 300mm to 750mm diameter, use prices for ductile iron mains (Table 2 on page 12) as these can perform the function of most existing steel mains and are less costly.

Table 4 Water Pumping Stations and Bores

(Distribution System Pumping Stations — does not include River Intakes)

	Installed Power *(kW)*	*Contract Rate* *($)* *2014*	*Civil* *(%)*	*M&E* *(%)*	*Reference Rate* *($)* *2014*
Distribution System Pumping Station	**10**	70 000	31	69	80 000
	20	100 000	30	70	115 000
	30	122 000	29	71	140 000
	50	165 000	28	72	190 000
	100	322 000	27	73	370 000
	200	504 000	38	62	580 000
	400	826 000	36	64	950 000
	600	1 190 000	34	66	1 370 000
	800	1 565 000	32	68	1 800 000
	1 000	1 910 000	30	70	2 200 000
	1 200	2 350 000	28	72	2 700 000
	1 400	2 740 000	26	74	3 150 000
	1 600	3 130 000	25	75	3 600 000
Bores	**5**	43 000			50 000
	115	248 000			285 000
	130	296 000			340 000

NOTES

1. These rates are for June 2014 valuation of the capital cost of existing assets and exclude contingencies and the GST. A suitable percentage for contingencies must be included (section 2.5 on page 8) for valuation of new works.
2. Review of recent contracts shows that the rates for distribution system pumping stations have increased by 10% to 35% above the capital cost inflation rate since 2003, while the rate for bores has increased by about 20%. These increases are not uniform over all size ranges.
3. Reference Rate = 1.15 x Contract Rate (ie. Contract Rate plus SID of 15%).
4. Installed power is the total installed motor power, including standby capacity.
5. This table only applies to distribution system pumping stations. Major additional costs would apply for pumping stations at river intakes (eg. for inlet training works, river channel works and flood protection). For pumping stations at river intakes see section 2.8 on page 9.
6. The rates are based on installation of two pumping machinery sets, each with half of the installed power for the pumping station. This provides standby capacity where if one pump is out of action the pumping station would still be able to deliver the required transfer capacity.
7. For each pumping machinery set, motor power is calculated using the formula :
   kW = Q (L/s) x h (m) x 1.1 (pipeline tolerance factor) / 100 x pump efficiency (say 0.8)
8. For power ≤ 100kW the rates are for lower cost, outdoor pumping stations. For units > 100kW the rates are for centrifugal pumps in an above ground pumping station on a level site.
9. Includes pipework within pumping station & connection to adjacent supply & delivery mains.
10. Land acquisition, power supply, data connection, access roads, fencing are not included.
11. Operation and maintenance costs are not included.

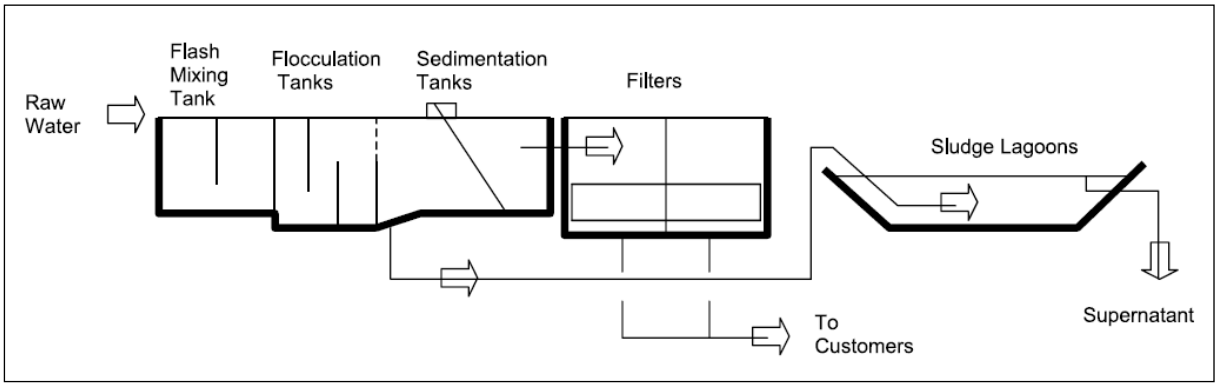

Figure 2 Conventional Water Treatment Works

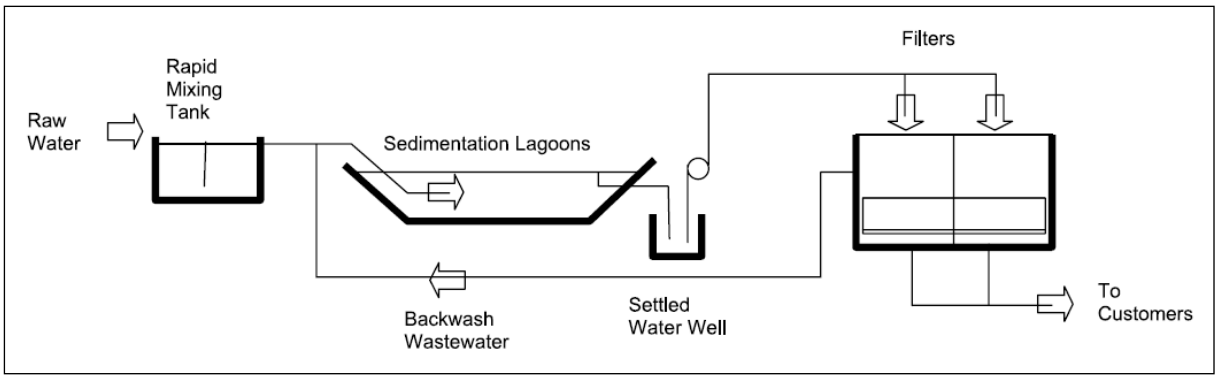

Figure 3 Lagoon Sedimentation

Figure 4 Lagoon Sedimentation Howlong (Corowa)

Table 5 Water Treatment Works

	Capacity *(ML/d)*	*Contract Rate ($) 2014*	*Reference Rate ($) 2014*
Conventional Water Treatment	**0.3**	958 000	1 150 000
	0.5	1 420 000	1 700 000
	0.8	1 920 000	2 300 000
	1	2 170 000	2 600 000
	2	3 670 000	4 400 000
	5	7 000 000	8 400 000
	10	11 700 000	14 000 000
	20	19 200 000	23 000 000
	40	30 800 000	37 000 000
	50	35 800 000	43 000 000
	70	46 700 000	56 000 000
	100	59 200 000	71 000 000
Lagoon Sedimentation	**0.8**	1 420 000	1 700 000
	1	1 580 000	1 900 000
	2	2 670 000	3 200 000
	5	4 920 000	5 900 000
	10	8 080 000	9 700 000
	20	13 300 000	16 000 000

NOTES

1. These rates are for June 2014 valuation of the capital cost of existing assets and exclude contingencies and the GST. A suitable percentage for contingencies must be included (section 2.5 on page 8) for valuation of new works. Refer to the box on page 17 for further information on the use of lagoon sedimentation for water treatment.
2. Review of recent contract rates for water treatment works has shown **increases** of **40%** or more above the capital cost inflation rate since 2003.
3. Reference Rate = 1.20 x Contract Rate (ie. Contract Rate plus SID of 20%).
4. The rates include civil, mechanical and electrical costs for both conventional water treatment works and also for lower cost lagoon sedimentation works.
5. For treatment works of ≥ 5 ML/d, the mechanical. electrical and process components of water treatment works are each approximately 13% of the Contract Rate, while the civil component is approximately 60% of the Contract Rate for the water treatment works and includes a clear water tank with 1 hour's storage capacity.
6. Excavation is in OTR.
7. Land acquisition, power supply, data connection, access roads and fencing are not included.
8. Operation and maintenance costs are not included.

Table 6 Water Chlorinators

	Capacity *(ML/d)*	*Contract Rate ($) 2014*	*Reference Rate ($) 2014*
Water Chlorinators	**Up to 10**	48 000	57 000
	20	53 000	63 000
	40	58 000	70 000
	80	63 000	76 000
	140	68 000	82 000

NOTES

1. These rates are for June 2014 valuation of the capital cost of existing assets and exclude contingencies and the GST. A suitable percentage for contingencies must be included (section 2.5 on page 8) for valuation of new works.
2. Reference Rate = 1.20 x Contract Rate (ie. Contract Rate plus SID of 20%).
3. The rates include process and dosing/metering equipment. The capital cost of the **chlorination room is excluded**.
4. The rates shown are for 'typical' water sources in NSW. For water sources with a high organic load, use the capital cost of chlorinators with twice the required capacity, as higher chlorine doses will be required.
5. Excavation is in OTR.
6. Land acquisition and power supply are not included.
7. Operation and maintenance costs are not included.

Lagoon Sedimentation

The Lagoon sedimentation concept for water treatment (refer to Figures 3 and 4 on page 15 and Table 5 on page 16) has been successfully developed and implemented by the NSW Office of Water and NSW Public Works as a cost-effective means of providing water treatment for regional NSW. Examples include:

Adelong (3 ML/d, 1996, Tumut), Barham (2 ML/d, 1993, Wakool), Binnaway (1 ML/d, 1993, Warrumbungle), Boorowa (3 ML/d, 1993, Boorowa), Buronga/Gol-Gol/Dareton (4 ML/d, 1994, Wentworth), Coonabarabran (8 ML/d, 1993, Warrumbungle), Coonamble (8 ML/d, under construction, Coonamble), Dorrigo (3 ML/d, 1993, Bellingen), Geurie (2 ML/d, 1994, Wellington), Howlong (5 ML/d, 1989, Corowa), Mendooran (1 ML/d, 2009, Warrumbungle), Murrami (0.3 ML/d, 1993, Leeton), Nundle (1 ML/d, 1995, Tamworth), Pooncarie (0.2 ML/d, 1994, Wentworth), Tottenham (1 ML/d, 1994, Lachlan) and Wellington (15 ML/d, 1993, Wellington).

Table 5 on page 16 shows that the capital cost of lagoon sedimentation is about 70% of the capital cost of a conventional water treatment works.

Table 7 Fluoridation Plants

	Capacity *(ML/d)*	*Contract Rate ($) 2014*	*Reference Rate ($) 2014*
Fluoridation Plants	**Up to 5**	92 000	110 000
	10	108 000	130 000
	20	158 000	190 000
	40	217 000	260 000
	80	308 000	370 000
	100	350 000	420 000

NOTES

1. These rates are for June 2014 valuation of the capital cost of existing assets and exclude contingencies and the GST. A suitable percentage for contingencies must be included (section 2.5 on page 8) for valuation of new works.
2. Reference Rate = 1.20 x Contract Rate (ie. Contract Rate plus SID of 20%).
3. The rates **include dosing/metering equipment** and the **fluoridation room**.
4. Excavation is in OTR.
5. Land acquisition and power supply are not included.
6. Operation and maintenance costs are not included.

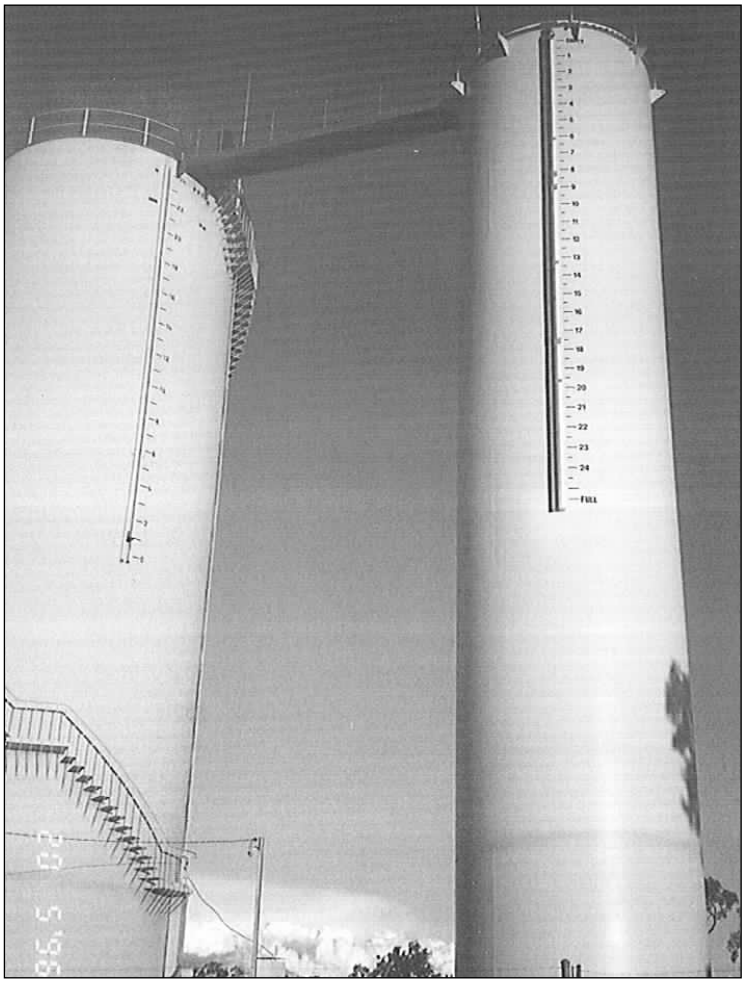

Figure 5 Standpipe Service Reservoir, Collarenebri (Walgett)

Figure 6 Ground Level Service Reservoir, Murwillumbah (Tweed)

Table 8 Water Service Reservoirs

	Storage (ML)	*Contract Rate* ($) 2014	*Reference Rate* ($) 2014
Steel Reservoirs	**0.5**	343 000	395 000
	1	513 000	590 000
	2	730 000	840 000
	4	1 000 000	1 150 000
	5	1 150 000	1 320 000
	8	1 570 000	1 800 000
	10	1 830 000	2 100 000
	15	2 480 000	2 850 000
	20	3 040 000	3 500 000
	30	4 000 000	4 600 000
Concrete Reservoirs	**0.1**	55 000	63 000
	0.2	91 000	105 000
	0.4	200 000	230 000
	0.5	274 000	315 000
	1	470 000	540 000
	2	870 000	1 000 000
	4	1 650 000	1 900 000
	5	1 910 000	2 200 000
	8	2 700 000	3 100 000
	10	3 040 000	3 500 000
	15	3 610 000	4 150 000
	20	3 910 000	4 500 000
Steel Standpipes	**0.5**	374 000	430 000
	1	548 000	630 000
	2	870 000	1 000 000
	3	1 090 000	1 250 000
	4	1 290 000	1 480 000

NOTES

1. These rates are for June 2014 valuation of the capital cost of existing assets and exclude contingencies and the GST. A suitable percentage for contingencies must be included (section 2.5 on page 8) for valuation of new works.
2. Review of recent contracts shows that rates for steel reservoirs have increased by about 15% above the capital cost inflation rate since 2003, while concrete reservoirs have increased by about 50% and steel standpipes by about 20%. The increases are not uniform over all sizes.
3. Reference Rate = 1.15 x Contract Rate (ie. Contract Rate plus SID of 15%).
4. The rates include foundation excavation, roofing, restoration, pipework, isolating valves and scour valves. **Control valves** (eg. motorised butterfly valves, altitude control valves) are **not included**.
5. "Standpipe" reservoirs are steel reservoirs which are taller than they are wide (Figure 5 on page 19).
6. A reservoir roof is assumed to be approximately 15% of the total capital cost while retrofitting a roof to a concrete reservoir is assumed to be approximately 20% of the total capital cost.
7. For asset valuation, depreciation should be calculated separately for the roof and for the reservoir structure.
8. Excavation is in OTR.
9. Land acquisition, power supply, data connection, access roads and fencing are not included.

Table 9 Sewer Mains (See also Table 17 on page 35 for additional costs)

	Dia	*Contract Rate*	*Reference Rate*			
	(mm)	*Min depth ($/m) 2014*	*Min depth ($/m) 2014*	*1.5–3m deep ($/m) 2014*	*3-4.5m deep ($/m) 2014*	*>4.5m deep ($/m) 2014*
Reticulation	**100**	136	150	216	315	400
	150	159	175	248	348	440
	225	218	240	320	432	550
	300	327	360	430	570	675
	375	450	490	590	705	820
	450	586	645	738	865	970
	500	686	750	830	970	1 090
	600	855	940	1 030	1 180	1 290
Trunk Mains	**150**	150	165	253	340	420
	225	200	220	315	410	505
	300	300	330	427	520	615
	375	409	450	553	660	765
	450	518	570	670	775	880
	500	605	665	775	885	990
	600	768	845	1 000	1 110	1 220
	750	1 010	1 110	1 340	1 450	1 570
Rising Mains (DICL)	**100**	105	115			
	150	145	160			
	200	173	190			
	250	214	235			
	300	269	295			
	375	364	400			
	450	459	505			
	500	527	580			
	600	670	740			
	750	871	960			

NOTES

1. These rates are for June 2014 valuation of the capital cost of existing assets and exclude contingencies and the GST. A suitable percentage for contingencies must be included (section 2.5 on page 8) for valuation of new works.
2. Review of recent contracts shows that rates for sewer mains have increased above the capital cost inflation rate since 2003 as follows – sewer reticulation mains and trunk mains by up to 10% and sewer rising mains (DICL) up to 35%. The increases are not uniform over all sizes.
3. Reference Rate = 1.10 x Contract Rate (ie. Contract Rate plus SID of 10%).
4. Caution: Additional costs apply for mains constructed in congested urban areas (eg. in town centres), in rock or where dewatering is required (refer Table 17 on page 35).
5. The rates allow for pipe supply, excavate, lay, backfill, restoration, fittings and thrust blocks.
6. "Reticulation" rates include an allowance for access chambers (or maintenance holes), sidelines and restoration.
7. "Trunk main" rates include an allowance for access chambers (or maintenance holes).
8. Excavation is in OTR.
9. Pipe materials are VC Class Z, AC Class 50, uPVC Class SNB, Concrete Class 2. For uPVC rising mains, use the values for a water trunk main shown on page 11.
10. Note that depreciation of sewers should be based on the cost of relining or renewing a sewer, as these avoid the need for excavation and backfill and are typically about 60% of the cost of reconstructing a shallow sewer ie. an existing sewer main would be valued at 40% of its replacement cost at the end of its useful life. For deep sewers, the saving from relining is correspondingly greater.

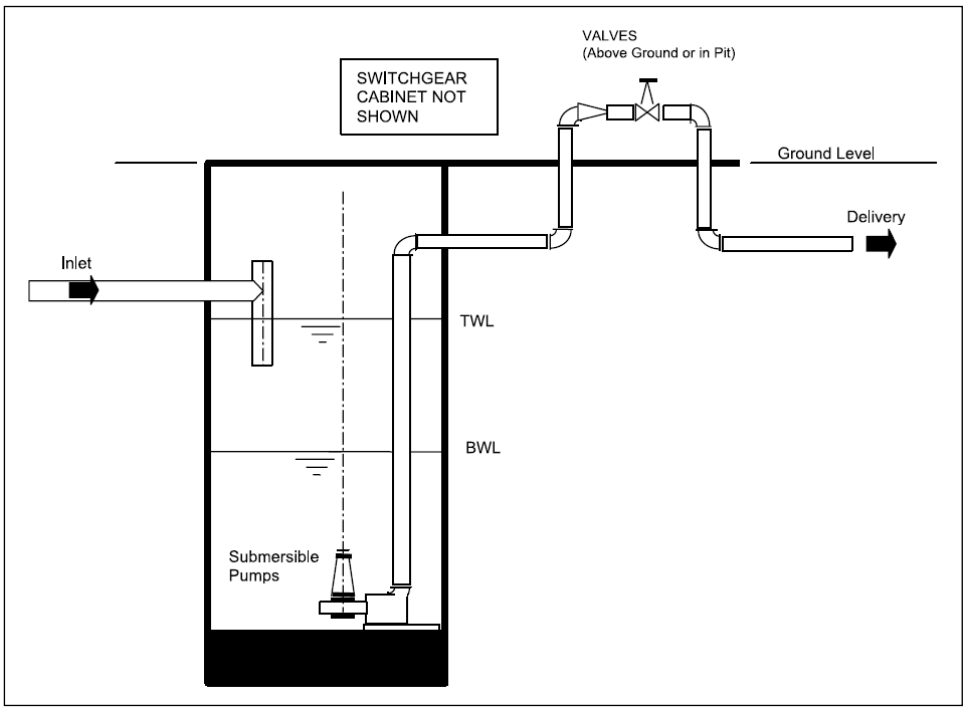

Figure 7 In-ground Submersible Pumping Station

Figure 8 In-ground Pumping Station

Table 10 Sewage Pumping Stations

(In-ground Submersible Type with Low Pumping Head)

	Flow *(L/s)*	*Contract Rate* *($)* *2014*	*Reference Rate* *($)* *2014*
Low Head In-ground Submersible	**10**	278 000	320 000
	20	365 000	420 000
	30	461 000	530 000
	40	548 000	630 000
	50	626 000	720 000
	60	696 000	800 000
	80	826 000	950 000
	100	930 000	1 070 000
	140	1 130 000	1 300 000
	180	1 300 000	1 500 000
	200	1 390 000	1 600 000

NOTES

1. These rates are for June 2014 valuation of the capital cost of existing assets and exclude contingencies and the GST. A suitable percentage for contingencies must be included (section 2.5 on page 8) for valuation of new works.
2. Review of recent contracts shows that rates for sewage pumping stations have increased significantly (by up to 140%) above the capital cost inflation rate since 2003. These increases are not uniform over all size ranges.
3. Reference Rate = 1.15 x Contract Rate (ie. Contract Rate plus SID of 15%).
4. Caution: The size and type of superstructure can add significant additional costs to the cost of the pumping station. These rates allow for submersible type pumping stations with low pumping heads (up to 50m). A superstructure is not included.
5. The rate includes excavation in OTR, concrete pumping station structure, mechanical and electrical works and controls, pipework within the pumping station and adjacent above ground weatherproof switchgear cabinet.
6. A typical submersible sewage pumping station layout is shown in Figure 7 on page 22.
7. The rates shown are for Design Flows (ie. Peak Wet Weather Flows).
8. Land acquisition and provision of power and data connection to the pumping station are not included.
9. Operation and maintenance costs are not included.
10. Emergency storage is not included.

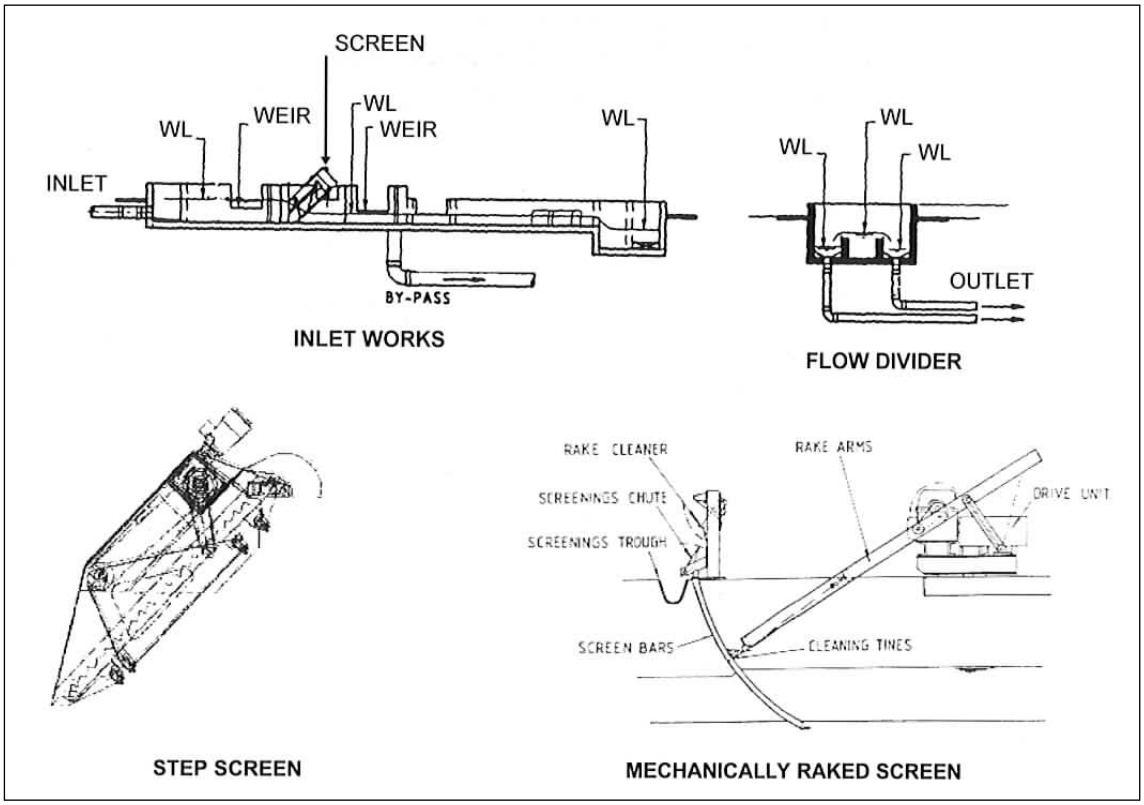

Figure 9 Elements of Preliminary Treatment

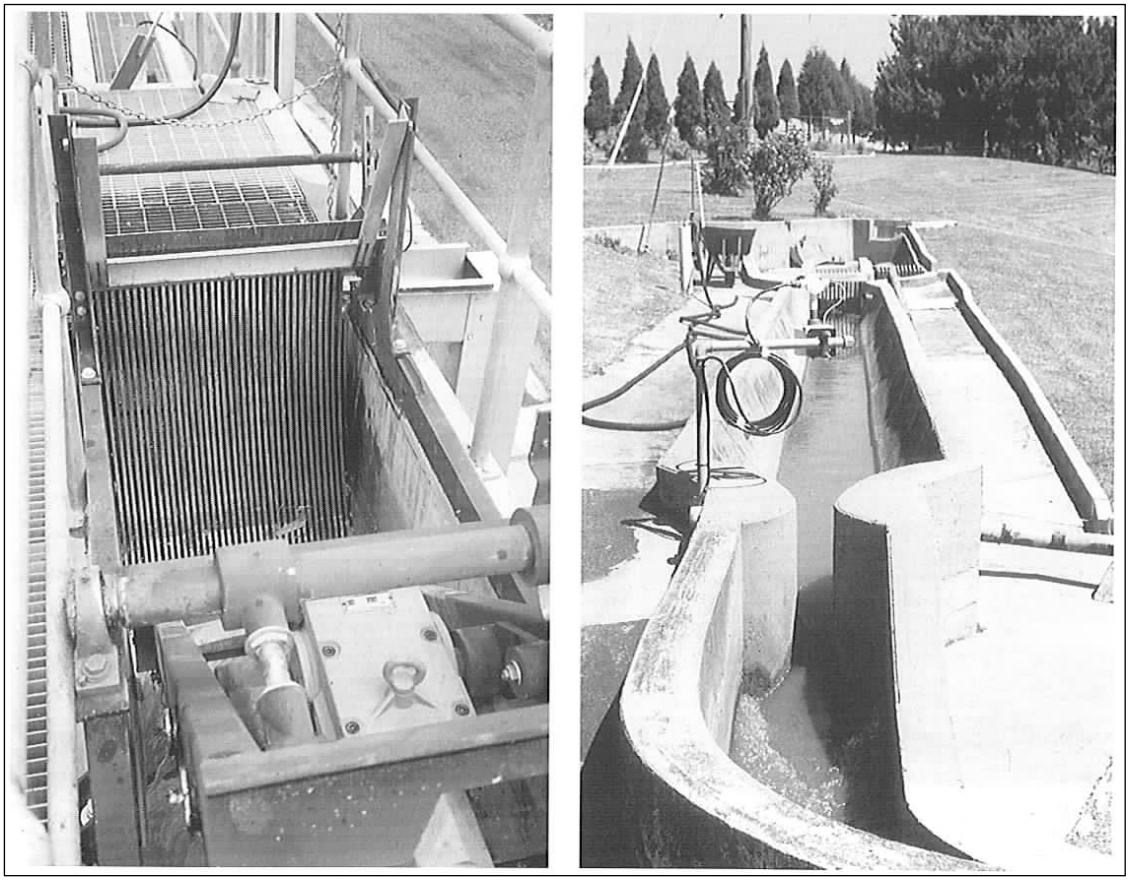

Figure 10 Mechanically Raked Bar Screen (left) and Grit Channel and Flume (right).

Table 11 Sewage Treatment Works - Siteworks

(For Preliminary Treatment see Table 12 on page 26, for Sludge Lagoons & Effluent Ponds see Table 13 on page 29, for Aeration Tanks see Table 14 on page 31, for UV Disinfection see Table 15 on page 33)

	EP *(EP x 1000)*	***Contract Rate*** *($) 2014*	***Reference Rate*** *($) 2014*
Siteworks (Local fencing, power and water within the site, roadworks within the site, amenities)	**2**	283 000	340 000
	4	400 000	480 000
	8	583 000	700 000
	12	683 000	820 000
	15	750 000	900 000
	20	892 000	1 070 000
	30	1 125 000	1 350 000

NOTES

1. These rates are for June 2014 valuation of the capital cost of existing assets and exclude contingencies and the GST. A suitable percentage for contingencies must be included (section 2.5 on page 8) for valuation of new works.
2. Review of recent contracts shows that the increase in rates for sewage treatment works – siteworks has remained similar to the capital cost inflation rate since 2003.
3. Reference Rate = 1.20 x Contract Rate (ie. Contract Rate plus SID of 20%).
4. The rate for sewage treatment consists of:

   Siteworks (common to all treatment processes) +

   (Prelim Treatment +/or Sludge Lagoons +/or Effluent Ponds +/or Filtration +/or Aeration +/or UV Disinfection) ie. select the relevant processes and add to Siteworks. Other treatment processes (sand filtration, chemical nutrient reduction etc.) should be estimated separately and also added.

   Refer also to the examples on pages 42 and 43.
5. Elements of preliminary treatment are illustrated in Figures 9 and 10 on page 24.
6. Excavation is in OTR.
7. Land acquisition, power supply to the site, data connection, access roads to the site and fencing around the site are not included.
8. Operation and maintenance costs are not included.

Table 12 Sewage Treatment Works - Preliminary Treatment

(For Siteworks see Table 11 on page 25, for Sludge Lagoons & Effluent Ponds see Table 13 on page 29, for Aeration Tanks see Table 14 on page 31, for UV Disinfection see Table 15 on page 33)

	EP *(EP)*	***Contract Rate*** *($) 2014*	***Reference Rate*** *($) 2014*
Mechanised Treatment	**8 000**	1 042 000	1 250 000
	12 000	1 292 000	1 550 000
	15 000	1 375 000	1 650 000
	20 000	1 580 000	1 900 000
	30 000	2 080 000	2 500 000
Nonmechanised Treatment	**2 000**	79 000	95 000
	4 000	100 000	120 000
	8 000	166 000	200 000
	12 000	200 000	240 000
	15 000	242 000	290 000

NOTES

1. These rates are for June 2014 valuation of the capital cost of existing assets and exclude contingencies and the GST. A suitable percentage for contingencies must be included (section 2.5 on page 8) for valuation of new works.
2. Review of recent contracts shows that the increase in rates for sewage treatment works – preliminary treatment (both mechanised and nonmechanised treatment) has remained similar to the capital cost inflation rate since 2003.
3. Reference Rate = 1.20 x Contract Rate (ie. Contract Rate plus SID of 20%).
4. The rate for sewage treatment consists of:

   Siteworks (common to all treatment processes) +

   (Prelim Treatment +/or Sludge Lagoons +/or Effluent Ponds +/or Filtration +/or Aeration +/or UV Disinfection)

   ie. select the relevant processes and add to Siteworks.

   Refer also to the examples on pages 42 and 43.

   Other treatment processes (sand filtration, chemical nutrient reduction etc.) should be estimated separately and also added.
5. Elements of preliminary treatment are illustrated in Figures 9 and 10 on page 24.
6. Excavation is in OTR.
7. Land acquisition, power supply to the site, data connection, access roads to the site and fencing around the site are not included.
8. Operation and maintenance costs are not included.

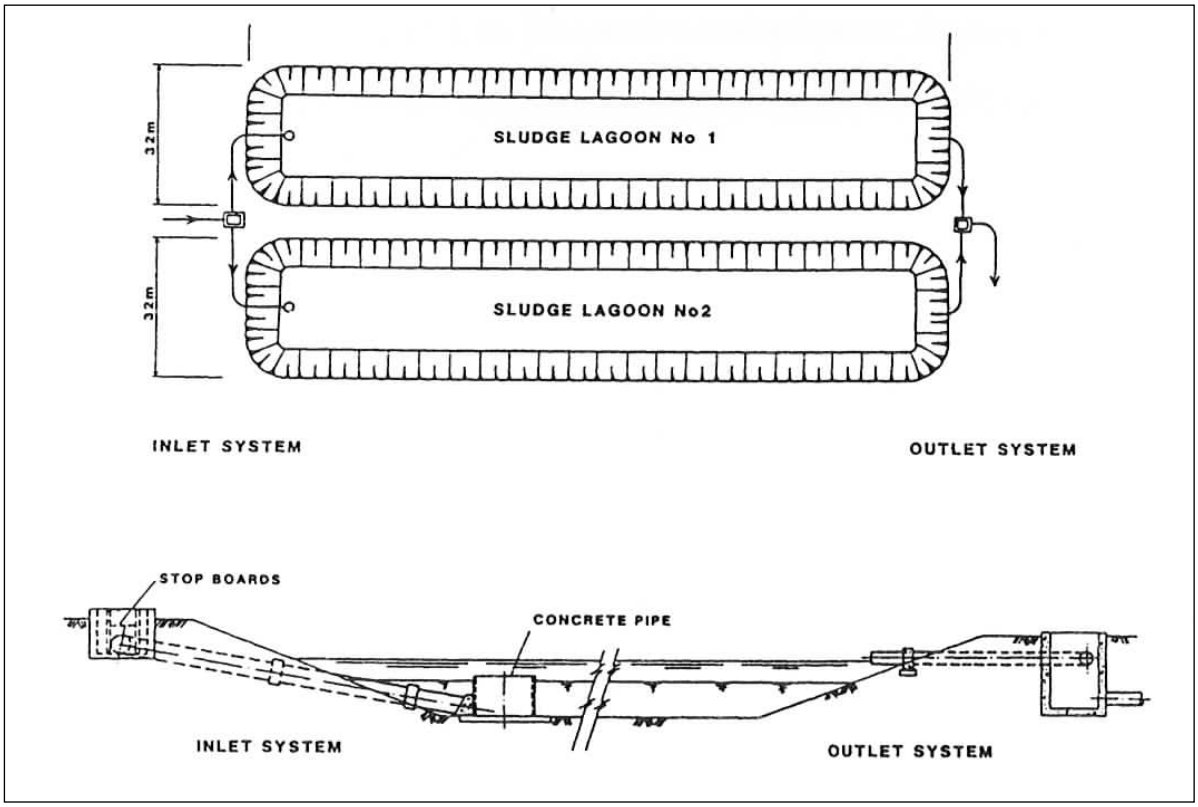

Figure 11 Typical Sludge Lagoon

Figure 12 Typical Sludge Lagoon, Shoalhaven Heads NSW

Figure 13 Aerated Lagoon, Cobar NSW

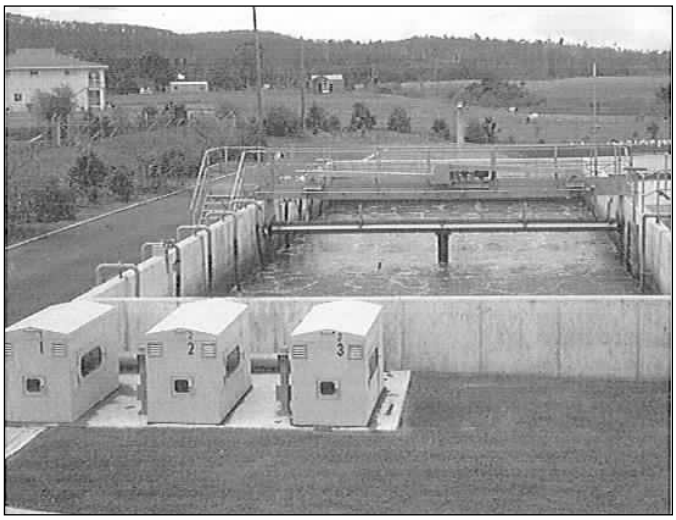

Figure 14 Intermittent Extended Aeration Tanks (IDEA), Port Macquarie NSW

Figure 15 Box Intermittent Extended Aeration Tanks (IDEA), Bathurst NSW

Table 13 Sewage Treatment Works - Sludge Lagoons & Effluent Ponds

(For Siteworks see Table 11 on page 25, for Preliminary Treatment see Table 12 on page 26, for Aeration Tanks see Table 14 on page 31, for UV Disinfection see Table 15 on page 33)

	EP	*Contract Rate ($) 2014*	*Reference Rate ($) 2014*
Sludge Lagoon No Mechanical Dewatering	**2 000**	192 000	230 000
	4 000	290 000	350 000
	8 000	483 000	580 000
	12 000	658 000	790 000
	15 000	750 000	900 000
Sludge Lagoon Mechanical Dewatering	**12 000**	1 140 000	1 370 000
	15 000	1 230 000	1 480 000
	20 000	1 420 000	1 700 000
	30 000	1 670 000	2 000 000
Effluent Pond	**2 000**	192 000	230 000
	4 000	292 000	350 000
	8 000	483 000	580 000
	12 000	658 000	790 000
	15 000	750 000	900 000

NOTES

1. These rates are for June 2014 valuation of the capital cost of existing assets and exclude contingencies and the GST. A suitable percentage for contingencies must be included (section 2.5 on page 8) for valuation of new works.
2. Review of recent contracts shows that rates for sludge lagoons (no mechanical dewatering) have increased by as much as 100% above the capital cost inflation rate since 2003, while the rate for sludge lagoons (mechanical dewatering) has not increased and the increase for effluent ponds is less than the capital cost inflation rate since 2003 by 15 to 35%. These changes are not uniform over all size ranges.
3. Reference Rate = 1.20 x Contract Rate (ie. Contract Rate plus SID of 20%).
4. The rate for sewage treatment consists of:

   Siteworks (common to all treatment processes) +

   (Prelim Treatment +/or Sludge Lagoons +/or Effluent Ponds +/or Filtration +/or Aeration +or UV Disinfection)

   ie. select the relevant processes and add to Siteworks.

   Refer also to the examples on pages 42 and 43.

   Other treatment processes (sand filtration, chemical nutrient reduction etc.) should be estimated separately and also added.
5. Sludge Lagoons are illustrated in Figures 11 and 12 on page 27. Figure 13 on page 28 shows an aerated lagoon.
6. Excavation is in OTR.
7. Land acquisition is not included.
8. Operation and maintenance costs are not included.

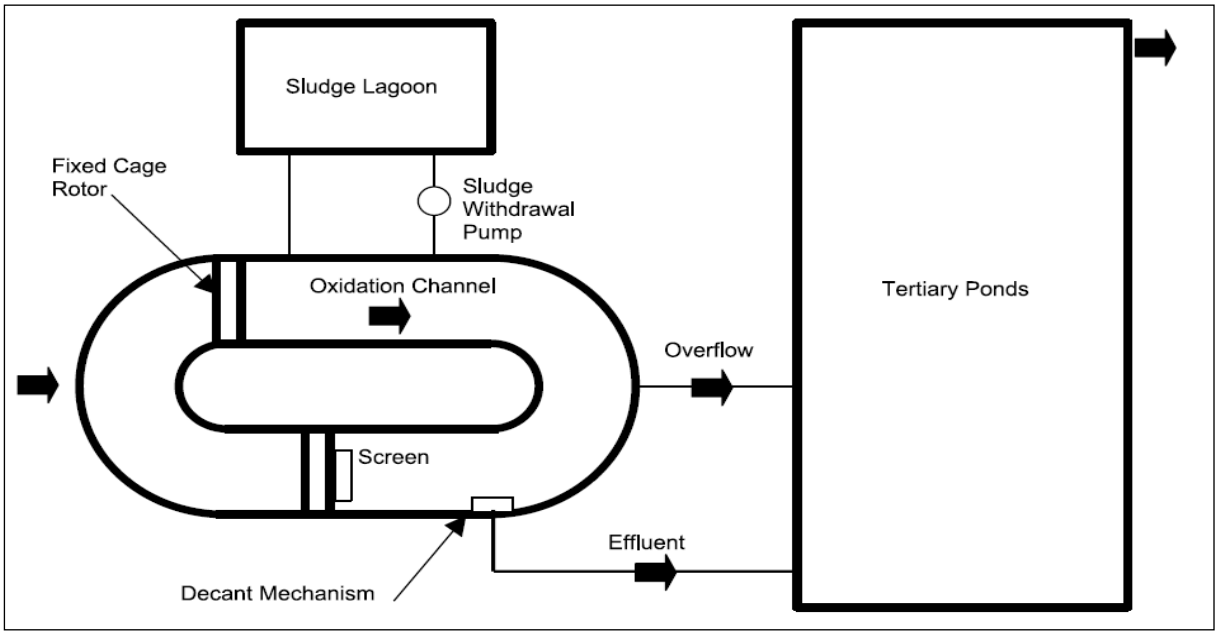

Figure 16 Intermittent Decanted Extended Aeration (IDEA) Channel

The intermittent decanted extended aeration (IDEA) process is a variation of the activated sludge process. It does not include preliminary treatment. Three aeration tank configurations are frequently used in NSW:

- Aeration Channel (**Pasveer Channel P1000, P2000**) – a shallow concrete lined, continuous channel in sizes 500 ep to 2000 ep. The aerators are brush type surface aerators, consisting of two independent rotors mounted on floats. **There is usually no pretreatment with this process.**
- Aeration Box (**Bathurst Box B4000**) – a rectangular concrete tank is used instead of a continuous channel, in sizes 2000 and 4000 ep. The aerators are pontoon mounted vertical shaft mechanical aerators.
- Aeration Tank (Port Macquarie Tank) – concrete lined earth tanks in sizes 4000 ep to 20 000 ep. Aerators are float mounted similar to a Bathurst Box.

A variation of the IDEA process is the continuous EA process which includes a clarifier to separate solids and liquids and a sludge return. The solids are recirculated and the liquids are drawn-off.

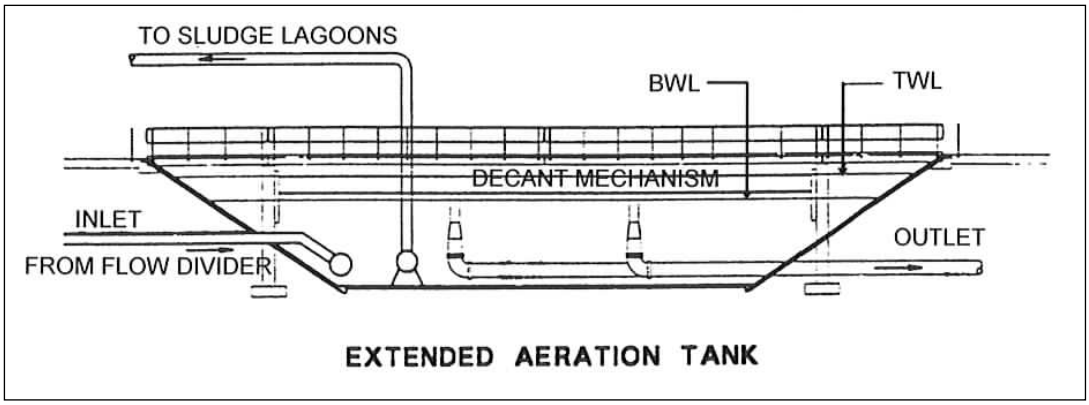

Figure 17 Typical Intermittently Decanted Extended Aeration Tank

Table 14 Sewage Treatment Works - Intermittent Decanted Extended Aeration (IDEA)

(For siteworks see Table 11 on page 25, for Preliminary Treatment see Table 12 on page 26, for sludge and effluent ponds see Table 13 on page 29, for UV disinfection see Table 15 on page 33. Does not include filtration, phosphorus removal or clarifier.)

	EP	*Contract Rate ($) 2014*	*Mech* (%)	*Elec* (%)	*Reference Rate ($) 2014*
Single Unit	**1 000**	625 000	46	12	750 000
	2 000	1 100 000	46	12	1 320 000
	4 000	1 830 000	46	12	2 200 000
	8 000	3 080 000	46	12	3 700 000
	12 000	4 330 000	46	12	5 200 000
	15 000	5 080 000	46	12	6 100 000
Double Unit	**4 000**	2 170 000	46	12	2 600 000
	8 000	3 250 000	46	12	3 900 000
	12 000	4 500 000	46	12	5 400 000
	15 000	5 330 000	46	12	6 400 000
	20 000	6 500 000	46	12	7 800 000
	30 000	8 420 000	46	12	10 100 000
P1000 Unit	**1 000**	875 000	50	12	1 050 000
	2 000	1 790 000	50	12	2 150 000
P2000 Unit	**2 000**	1 790 000	50	10	2 150 000
	4 000	3 080 000	50	10	3 700 000
	8 000	5 500 000	50	10	6 600 000
B4000 Unit	**4 000**	2 330 000	33	8	2 800 000
	8 000	4 420 000	33	8	5 300 000
	12 000	5 670 000	33	8	6 800 000
Twin B4000 Unit	**4 000**	1 320 000			1 580 000
	8 000	3 080 000	30	8	3 700 000
	12 000	4 420 000			5 300 000

* Typical Mechanical and Electrical costs are shown as a percentage of the Contract Rate

NOTES:

1. These rates are for June 2014 valuation of the capital cost of existing assets and exclude contingencies and the GST. A suitable percentage for contingencies must be included (section 2.5 on page 8) for valuation of new works.
2. Review of recent contracts shows that rates for aeration tanks, P1000 Units and P2000 Units have **increased** by about **10%** above the capital cost inflation rate since 2003.
3. Reference Rate = 1.20 x Contract Rate (ie. Contract Rate plus SID of 20%).
4. The rate for IDEA sewage treatment consists of:
   Siteworks (common to all treatment processes) +(Sludge Lagoons +/or Effluent Ponds + Aeration Tanks +/or UV Disinfection) ie. select the relevant processes and add to Siteworks.
   Refer also to the examples on pages 42 and 43.

Other treatment processes (sand filtration, chemical nutrient reduction etc.) should be estimated separately and also added.

5. The IDEA process and terminology is illustrated on page 30. Examples of Aeration Tanks are shown in Figures 14 and 15 on page 28.
6. Phosphorus removal is not included. This could add from $200,000 to $500,000 to the contract cost, depending on the size of the works.
7. **Tertiary filtration** is not included in Table 14. Preliminary figures suggest that this can add a further 15% to the total treatment works cost.
8. Excavation is in OTR.
9. Land acquisition, power supply, data connection, access roads and fencing are not included.
10. These rates should also be used for existing Trickling Filter and Continuous Aeration treatment works.
11. Operation and maintenance costs are not included.

Table 15 Sewage Treatment Works - UV Disinfection

(For siteworks see Table 11 on page 25, for Preliminary Treatment see Table 12 on page 26, for sludge lagoons and effluent ponds see Table 13 on page 29, for Aeration Tanks see Table 14 on page 31.)

	EP	*Contract Rate ($) 2014*	*Civil Works* (%)	*Disinfection Equipment* (%)	*Reference Rate ($) 2014*
UV Disinfection	**4 000**	175 000	10	90	210 000
	8 000	217 000	11	89	260 000
	12 000	267 000	12	88	320 000
	15 000	292 000	13	87	350 000
	20 000	342 000	14	86	410 000
	30 000	442 000	14	86	530 000
	40 000	533 000	15	85	640 000
	80 000	1 030 000	15	85	1 230 000
Civil Cost	**4 000**	18 000			21 000
	8 000	24 000			29 000
	12 000	32 000			38 000
	15 000	38 000			45 000
	20 000	48 000			58 000
	30 000	62 000			74 000
	40 000	79 000			95 000
	80 000	154 000			185 000

NOTES:

1. These rates are for June 2014 valuation of the capital cost of existing assets and exclude contingencies and the GST. A suitable percentage for contingencies must be included (section 2.5 on page 8) for valuation of new works.
2. Review of recent contracts shows that increase in rates for UV Disinfection has been slightly below the capital cost inflation rate since 2003.
3. Reference Rate = 1.20 x Contract Rate (ie. Contract Rate plus SID of 20%).
4. The rate for UV sewage disinfection consists of:

   UV Disinfection Equipment + civil cost (for UV disinfection only, for other civil costs see siteworks below) + Siteworks (common to all treatment processes) +

   (Sludge Lagoons +/or Effluent Ponds +/or Filtration or Aeration)

   ie. select the relevant processes and add to Siteworks.

   Refer also to the examples on pages 42 and 43.

   Other treatment processes (sand filtration, chemical nutrient reduction etc.) should be estimated separately and also added.
5. Excavation is in OTR.
6. Land acquisition is not included.
7. Operation and maintenance costs are not included.

Table 16 MBR Sewage Treatment Works

Capacity (DWF) ML/d	7.9	7.2	4	1	0.34
Design wet weather	3xADWF	3xADWF	1.1xADWF	1xADWF	3xADWF
Inlet works	Fine screens only	Included	Fine screens only	Included	Included
No. of process trains	3	1	1	1	1
No. of MBR trains	3	4	2	2	2
Biosolids treatment included	Dewatering	Aerobic digester and onsite long term covered storage	No	No	No
Effluent facilities	UV	UV, chlorination, large storage tank, pumping	UV, chlorination, CCT, storage tank, pumping, elevated storage	UV	UV, chlorination, CCT, pumping
Wet weather management	Diversion to existing ponds	Balance tank, diversion to existing pond	No	No	Balance pond
Other features affecting price		Pile foundation, includes demolition of old plant, significant fill	Includes feed pumping station	Compact design (sewer mining), no site works, includes pumping from sewer	Low temperature
Contract Rate ($M)	26	37	32	4	4
Reference Rate ($M)	31	44	38	4.6	4.7

NOTES:

1. These rates are for June 2014 valuation of the capital cost of existing assets and exclude contingencies and the GST. A suitable percentage for contingencies must be included (section 2.5 on page 8) for valuation of new works.
2. Reference Rate = 1.20 x Contract Rate (ie. Contract Rate plus SID of 20%).
3. Costs include design and commissioning of membrane bioreactor (MBR) sewage treatment works.
4. Costs exclude land acquisition, fence, access road, but include internal roads and site services.
5. Excavation is in OTR.
6. Land acquisition is not included.
7. Operation and maintenance costs are not included.

Table 17 Additional Costs for Construction Difficulty, Rock Excavation and Dewatering

	Dia	*Contract Rate*	*Reference Rate*			
		Min depth ($/m) *2014*	*Min depth* ($/m) *2014*	*1.5m deep* ($/m) *2014*	*3m deep* ($/m) *2014*	*4.5m deep* ($/m) *2014*
Rock excavation						
Trench excavation (10% rock)	**100**	5	6	16	33	48
	150	6	7	18	34	51
	200	7	8	18	37	54
	250	8	9	20	39	58
	300	11	12	20	42	63
	375	14	15	24	51	77
	450	17	19	27	57	86
	500	18	20	29	63	95
	600	23	25	34	66	102
	750	34	37	42	86	136
	900	46	51	51	104	157
Construction Difficulty						
MODERATE	**100**	37	42			
Ie. suburban site	**150**	56	61			
with other services,	**200**	74	81			
residential roads	**250**	93	102			
and traffic control	**300**	111	122			
	375	148	162			
	450	184	203			
	500	210	231			
	600	247	271			
	750	321	353			
	900	380	407			
HIGH	**100**	74	81			
ie. suburban site	**150**	119	131			
with other services,	**200**	148	162			
residential roads	**250**	184	203			
and traffic control	**300**	222	244			
	375	296	326			
	450	380	407			
	500	413	457			
	600	487	535			
	750	641	705			
	900	740	814			
Dewatering						
Assuming well point	**150**	93	102			
Dewatering. Note	**300**	104	115			
this may only apply	**500**	111	122			
to part of the length	**600**	123	136			
	900	130	142			

NOTES

1. These rates are for June 2014 valuation of the capital cost of existing assets and exclude contingencies and the GST. A suitable percentage for contingencies must be included (section 2.5 on page 8) for valuation of new works.
2. Reference Rate = 1.10 x Contract Rate (ie. Contract Rate plus SID of 10%).
3. Caution: These are additional costs which should be added to the rates determined from Table 1 on page 11, Table 2 on page 12, Table 3 on page 13, Table 9 on page 21 and Table 18 on page 36. These additional costs should be applied with judgement and care since they may represent a significant part of the total capital cost.

Table 18 Stormwater Mains

(See also Table 17 on page 35 for additional costs)

	Dia (mm)	*Contract Rate* ($/m) 2014	*Reference Rate* ($/m) 2014
uPVC	**100**	62	68
	150	76	84
	225	125	137
	300	191	210
	375	236	260
FRC	**300**	164	180
	375	209	230
	450	273	300
	525	318	350
	600	364	400
	750	509	560
RCP	**300**	145	160
	375	200	220
	450	273	300
	525	327	360
	600	364	400
	750	482	530
	900	727	800
	1 200	1 180	1 300
	1 500	1 730	1 900
	1 800	2 590	2 850

NOTES

1. These rates are for June 2014 valuation of the capital cost of existing assets and exclude contingencies and the GST. A suitable percentage for contingencies must be included (section 2.5 on page 8) for valuation of new works.
2. Review of recent contracts shows that rates for **uPVC** stormwater mains have **increased** by as much as **33%** above the capital cost inflation rate since 2003, while the rate for FRC stormwater mains has increased by up to 35% and the rate for RCP stormwater mains has increased by up to 25%. These increases are not uniform over all size ranges.
3. Reference Rate = 1.10 x Contract Rate (ie. Contract Rate plus SID of 10%).
4. The rates include clearing, supply, excavate, lay, backfill and restoration.
5. Restoration is assumed to be in the ratio 20% footpath, 20% roadway and 60% lawn.
6. The rates do not include stormwater pits (see Table 19 on page 37).
7. The rates do not include tipping or disposal of spoil.
8. Excavation is in OTR. For rock see Table 17 on page 35.
9. Pipe materials in Table 18 above are uPVC Class SNB and Concrete Class 2.
10. Caution: Additional costs apply for mains constructed in congested urban areas, in rock or where dewatering is required (refer Table 17 on page 35).

Table 19 Stormwater Pits

	SIZE ***W x B*** *(mm)*	***Contract Rate*** *($/m) 2014*	***Reference Rate*** *($/m) 2014*
Junction Pit			
Ungrated	**600 x 600**	1 270	1 400
	900 x 900	1 550	1 700
Grated	**600 x 600**	1 820	2 000
	900 x 900	2 090	2 300
Kerb Inlet Pit	**Single Grate**	1 550	1 700
	Double Grate 1m Lintel	2 180	2 400
	Double Grate Extended Lintel	2 360	2 600

NOTES

1. These rates are for June 2014 valuation of the capital cost of existing assets and exclude contingencies and the GST. A suitable percentage for contingencies must be included (section 2.5 on page 8) for valuation of new works.
2. Review of recent contracts shows that the increase in rates for stormwater junction pits has remained similar to the capital cost inflation rate since 2003.
3. Reference Rate = 1.10 x Contract Rate (ie. Contract Rate plus SID of 10%).
4. The rates include supply, excavate, construct, backfill and restoration.
5. Excavation is in OTR.

Table 20 Stormwater Culverts

	SIZE *(mm)*	*Contract Rate ($/m) 2014*	*Reference Rate ($/m) 2014*
Box Culvert	**375 x 225**	227	250
	600 x 450	397	430
	750 x 600	645	710
	1 050 x 450	1 000	1 100
	1 200 x 900	1 090	1 200
Precast Pipe Culvert (diameter)	**300**	168	185
	450	336	370
	600	482	530
	750	727	800
	900	940	1 030
	1200	1 290	1 420
	1500	1 640	1 800
	1800	2 590	2 850
Headwall (Single) (diameter)	**300**	382	420
	450	382	420
	600	673	740
	750	1 050	1 150
	900	1 360	1 500
	1 200	3 090	3 400
	1 500	4 270	4 700
Headwall (Double) (diameter)	**300**	955	1 050
	600	1 450	1 600
	1 200	5 730	6 300
	1 500	8 180	9 000
	1 800	12 500	13 700

NOTES

1. These rates are for June 2014 valuation of the capital cost of existing assets and exclude contingencies and the GST. A suitable percentage for contingencies must be included (section 2.5 on page 8) for valuation of new works.
2. Review of recent contracts shows that the increase in rates for stormwater box culverts has remained similar to the capital cost inflation rate since 2003, while the rate for stormwater single headwalls has increased by up to 70% and the rate for stormwater double headwalls has increased by up to 30%. These increases are not uniform over all size ranges.
3. These rates are based on limited data and should be used with caution.
4. Reference Rate = 1.10 x Contract Rate (ie. Contract Rate plus SID of 10%).
5. The rates include supply, excavate and construct.

4. Applying the Reference Rates

Water mains or sewer mains – select the Reference Rate for the particular diameter and type of pipe from Table 1 on page 11, Table 2 on page 12, Table 3 on page 13 or Table 9 on page 21 and add to this rate any additional costs for rock excavation, dewatering or construction difficulty from Table 17 on page 35.

Water pumping station (distribution), sewage pumping station, service reservoir or water treatment works – select the appropriate table in section 3 on page 10 for the facility and extracting the Reference Rate for the particular facility characteristics (eg. installed power for a water pumping station).

Sewage treatment works – from Table 11 (on page 25) to Table 16 (on page 34). Select the Reference Rate for the particular type of facility and add the Reference Rate for the siteworks together with the Reference Rate for preliminary treatment, sludge lagoons or effluent ponds as appropriate.

Stormwater assets – select the Reference Rate for the particular diameter and type of main or culvert from Table 18 on page 36, Table 19 on page 37 and Table 20 on page 38 and add to this rate the cost of disposal of spoil and any additional costs for rock excavation, dewatering or construction difficulty from Table 17 on page 35.

The costs of land acquisition, access roads, power supply, data connection and fencing should also be included where appropriate as indicated in section 2.7 on page 8.

Examples of valuations are shown below.

4.1. Water Supply Mains

4.1.1 Example 1: 150 Diameter AC Water Supply Reticulation Main

As AC is no longer current technology, existing AC mains should be valued at the replacement cost for current technology, which is uPVC mains.

The Total Rate (in $/m) is required for a 150mm diameter uPVC water supply reticulation main, at minimum depth.

Reference Rate for 150mm uPVC Water Retic Main = $140/m Refer Table 1 on page 11

4.1.2 Example 2: 200 Diameter DICL Water Supply Trunk Main

The Total Rate (in $/m) is required for a 200mm diameter DICL water supply trunk main, at minimum depth.

Reference Rate for 200mm DICL Water Trunk Main = $190/m Refer Table 2 on page 12

4.1.3 Example 3: 375 Diameter uPVC Water Supply Trunk Main

The Total Rate (in $/m) is required for a 375mm diameter uPVC water supply trunk main, at minimum depth.

Reference Rate for 375mm uPVC Water Trunk Main = $370/m Refer Table 1 on page 11

4.1.4 Example 4: 600 Diameter Steel Water Supply Trunk Main

The Total Rate (in $/m) is required for a 600mm diameter Steel water supply trunk main, at minimum depth. For this size of main it would be appropriate to use Ductile Iron as this is less costly than steel.

Reference Rate for 600mm DICL Water Trunk Main = $750/m Refer Table 2 on page 12

4.1.5 Example 5: 200 Diameter DICL Water Supply Trunk Main with 5% Rock

The Total Rate (in $/m) is required for a 200mm diameter DICL water supply trunk main, at minimum depth with 5% rock.

Reference Rate for 200mm DICL Water Trunk Main	= $190/m	Refer Table 2 on page 12
Reference Rate for 5% rock excavation (5/10 x $8/m)	= $ 4/m	Refer Table 17 on page 35
Total Rate	= $194/m	

4.1.6 Example 6: 200 Diameter DICL Water Supply Trunk Main with Moderate Construction Difficulty

The Total Rate (in $/m) is required for a 200mm diameter DICL water supply trunk main, at minimum depth with moderate construction difficulty.

Reference Rate for 200mm DICL Water Trunk Main	= $190/m	Refer Table 2 on page 12
Reference Rate for moderate construction difficulty	= $ 81/m	Refer Table 17 on page 35
Total Rate	= $271/m	

4.2. Sewer Mains

4.2.1 Example 7: 150 Diameter VC Sewer Reticulation Main at Minimum Depth

The Total Rate (in $/m) is required for a 150mm diameter VC sewer reticulation main, at minimum depth.

Reference Rate for 150mm VC Sewer Retic Main = $175/m Refer Table 9 on page 21

4.2.2 Example 8: 225 Diameter uPVC Sewer Trunk Main at Minimum Depth

The Total Rate (in $/m) is required for a 225mm diameter uPVC sewer trunk main, at minimum depth.

Reference Rate for 225mm uPVC Sewer Trunk Main = $220/m Refer Table 9 on page 21

4.2.3 Example 9: 100 Diameter uPVC Sewer Rising Main at Minimum Depth

The Total Rate (in $/m) is required for a 100mm diameter uPVC sewer rising main, at minimum depth.

As indicated in note 9 on page 21, use the value in Table 1 for a 100 uPVC trunk main, ie. $80/m.

Reference Rate for 100mm uPVC Sewer Rising Main = $ 85/m Refer Table 1 on page 11

4.2.4 Example 10: 300 Diameter VC Sewer Reticulation Main - 3m Depth

The Total Rate (in $/m) is required for a 300mm diameter VC sewer reticulation main, at 3m depth.

Reference Rate for 300mm VC Sewer Retic Main = $ 430/m Refer Table 9 on page 21

4.2.5 Example 11: 300 Diameter VC Sewer Reticulation Main - 4m Depth, 15% Rock

The Total Rate (in $/m) is required for a 300mm diameter VC sewer reticulation main, at 4m depth with 15% rock.

Reference Rate for 300mm VC Sewer Retic Main = $ 570/m Refer Table 9 on page 21

Reference Rate for 15% rock is:

15/10 x [$42+1/1.5*($63-$42)] = $ 84/m Refer Table 17 on page 35

Total Rate = $ 654/m

4.2.6 Example 12: 300 Diameter VC Sewer Reticulation Main - 3m Depth with High Construction Difficulty

The Total Rate (in $/m) is required for a 300mm diameter VC sewer reticulation main, at 3m depth with high construction difficulty.

Reference Rate for 300mm VC Sewer Retic Main = $ 430/m Refer Table 9 on page 21

Reference Rate for high construction difficulty = $ 244/m Refer Table 17 on page 35

Total Rate = $ 674/m

4.3. Water Pumping Stations

4.3.1 Example 13: Water Pumping Station (1200 kW)

The cost is required for a water distribution pumping station with installed power of 1200 kW.

Reference Rate for Civil Cost = $ 756 000 Refer Table 4 on page 14

Reference Rate for M & E Cost = $1 944 000 Refer Table 4 on page 14

Total Cost = $2 700 000

Note: Costs for land acquisition, access road and power supply must be added (section 2.6 on page 8).

4.4. Water Treatment Works

4.4.1 Example 14: Water Treatment Works of 10 ML/d Capacity

The cost is required for a water treatment works of 10 ML/d capacity.

Reference Rate for Lagoon Sedimentation = $9 700 000 Refer Table 5 on page 16

or

Reference Rate for Conventional Water Treatment = $14 000 000 Refer Table 5 on page 16

Note: Costs for land acquisition, access road and power supply must be added (section 2.6 on page 8).

4.5. Service Reservoirs

4.5.1 Example 15: Service Reservoir (4ML Storage Capacity)

The cost is required for a service reservoir of 4 ML capacity.

Reference Rate for a Steel Reservoir = $1 150 000 Refer Table 8 on page 20

Reference Rate for a Concrete Reservoir = $1 900 000 Refer Table 8 on page 20

Reference Rate for a Steel Standpipe Reservoir = $1 480 000 Refer Table 8 on page 20

Note: Costs for control valves, land acquisition and access road must be added (section 2.6 on page 8).

4.6. Sewage Pumping Stations

4.6.1 Example 16: Sewage Pumping Station (Peak Wet Weather Flow 30 L/s at 30m head)

The cost is required for a sewage pumping station with a Peak Wet Weather Flow of 30 L/s at a head of 30m.

Reference Rate for Pumping Station = $ 530 000 Refer Table 10 on page 23

Note: Costs for land acquisition, access road and power supply must be added (section 2.6 on page 8).

4.7. Sewage Treatment Works

4.7.1 Example 17: Double Unit Biological Trickling Filtration Plant for 8,000 EP

The cost is required for a sewage treatment works for 8,000 EP consisting of a double unit biological trickling filtration plant with mechanised preliminary treatment, a sludge lagoon with no mechanical dewatering and an effluent pond.

As a trickling filter is no longer current technology, use the reference rate for an Aeration Tank (Table 14 on page 31)

Reference Rate for Siteworks	= $ 700 000	Refer Table 11 on page 25
Reference Rate for Preliminary Treatment	= $1 250 000	Refer Table 12 on page 26
Reference Rate for a Sludge lagoon	= $ 580 000	Refer Table 13 on page 29
Reference Rate for Effluent Pond	= $ 580 000	Refer Table 13 on page 29
Reference Rate for Aeration Tank	= $3 700 000	Refer Table 14 on page 31
Total Cost	= $6 810 000	

Note: Costs for land acquisition, access road and power supply must be added (section 2.6 on page 8).

4.7.2 Example 18: Double Unit Extended Aeration Tank for 12,000 EP

The cost is required for a sewage treatment works for 12,000 EP consisting of a double unit extended aeration tank with mechanised preliminary treatment, a sludge lagoon with mechanical dewatering, an effluent pond and UV disinfection.

Reference Rate for Siteworks	= $ 820 000	Refer Table 11 on page 25
Reference Rate for Preliminary Treatment	= $ 1 550 000	Refer Table 12 on page 26
Reference Rate for a Sludge lagoon	= $ 1 370 000	Refer Table 13 on page 29
Reference Rate for Effluent Pond	= $ 790 000	Refer Table 13 on page 29
Reference Rate for Aeration Tank	= $ 5 400 000	Refer Table 14 on page 31
Reference Rate for UV Disinfection	= $ 320 000	Refer Table 15 on page 33
Total Cost	= $10 250 000	

Note: Costs for land acquisition, access road and power supply must be added (section 2.6 on page 8).

4.7.3 Example 19: B4000 Extended Aeration Box for 4,000 EP

The cost is required for a sewage treatment works for 4000 EP consisting of a B4000 extended aeration box with preliminary treatment (non-mechanised), a sludge lagoon with no mechanical dewatering and no effluent pond.

Reference Rate for Siteworks	= $ 480 000	Refer Table 11 on page 25
Reference Rate for Preliminary Treatment	= $ 120 000	Refer Table 12 on page 26
Reference Rate for a Sludge lagoon	= $ 350 000	Refer Table 13 on page 29
Reference Rate for B4000 Extended Aeration Box	= $2 800 000	Refer Table 14 on page 31
Total Cost	= $3 750 000	

Note: Costs for land acquisition, access road and power supply must be added (section 2.6 on page 8).

4.8. Stormwater

4.8.1 Example 20: 450 Diameter RCP Stormwater Main

The Total Rate (in $/m) is required for a 450mm diameter RC stormwater main at minimum depth.

Reference Rate for 450mm RCP Stormwater Main = $ 300/m Refer Table 18 on page 36

Note: Costs for spoil disposal must be added where appropriate.

4.8.2 Example 21: Kerb Inlet Pit (Double Grate with Extended Lintel)

The Cost (in $) is required for a Kerb Inlet Pit with Double Grate and 1m extended lintel.

Reference Rate for Kerb Inlet Pit = $2 600 Refer Table 19 on page 37

Note: Costs for spoil disposal must be added where appropriate.

4.8.3 Example 22: 600 Diameter RCP Stormwater Culvert beneath Road Embankment

The Cost (in $) is required for a 600mm diameter RCP stormwater main 20m long, beneath a road embankment with precast headwalls at each end.

Reference Rate for 600mm RCP Stormwater Main

($400/m x 20m) = $8 000 Refer Table 18 on page 36

Reference Rate for double headwalls

= $1 600 Refer Table 20 on page 38

Total Cost = $9 600

The above cost this does not include an amount for the road surface.

Note: Costs for spoil disposal must be added where appropriate.

5. Contract Rates – Figures 18 to 34

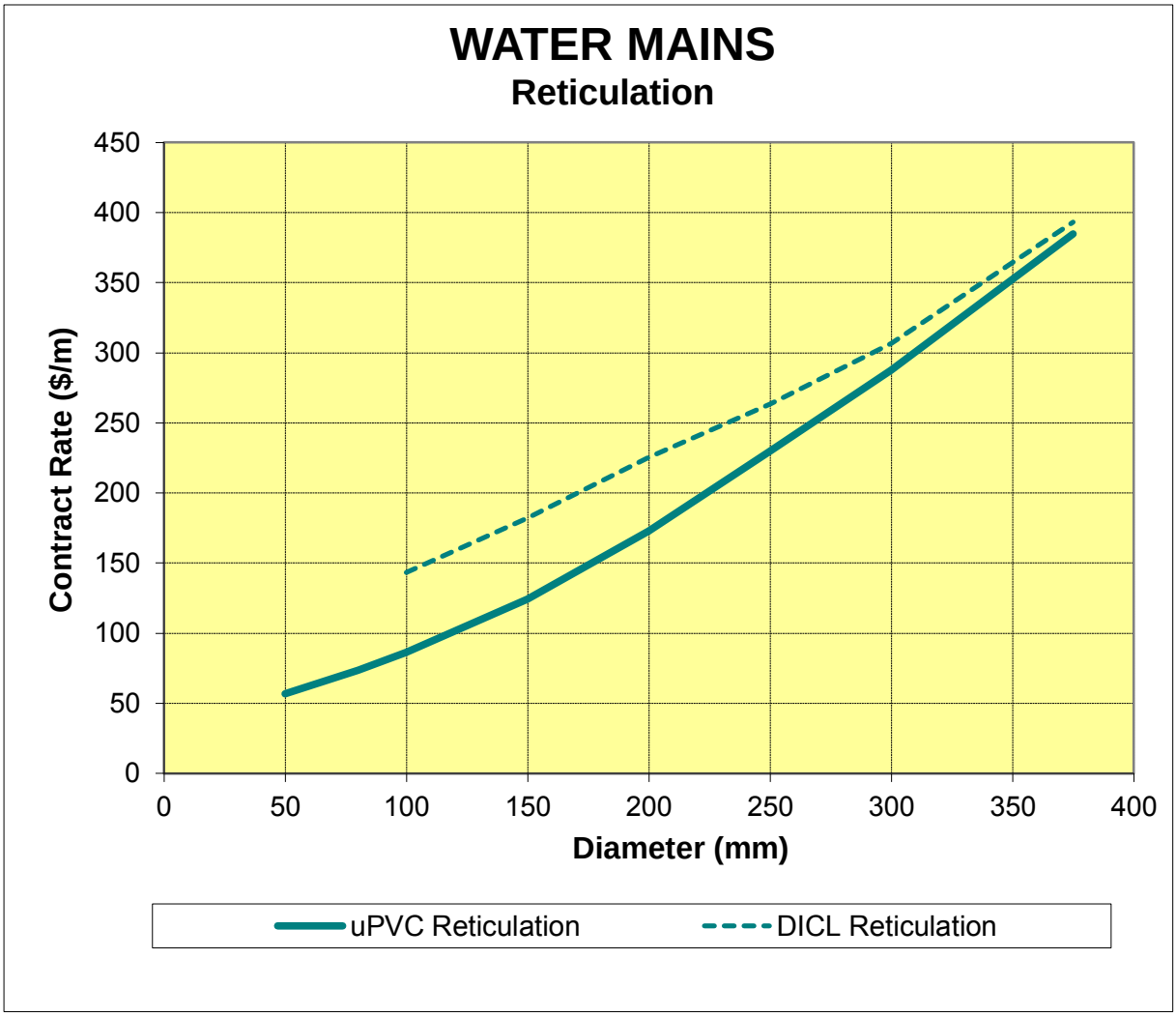

Figure 18 Water Mains – Reticulation (June 2014$)

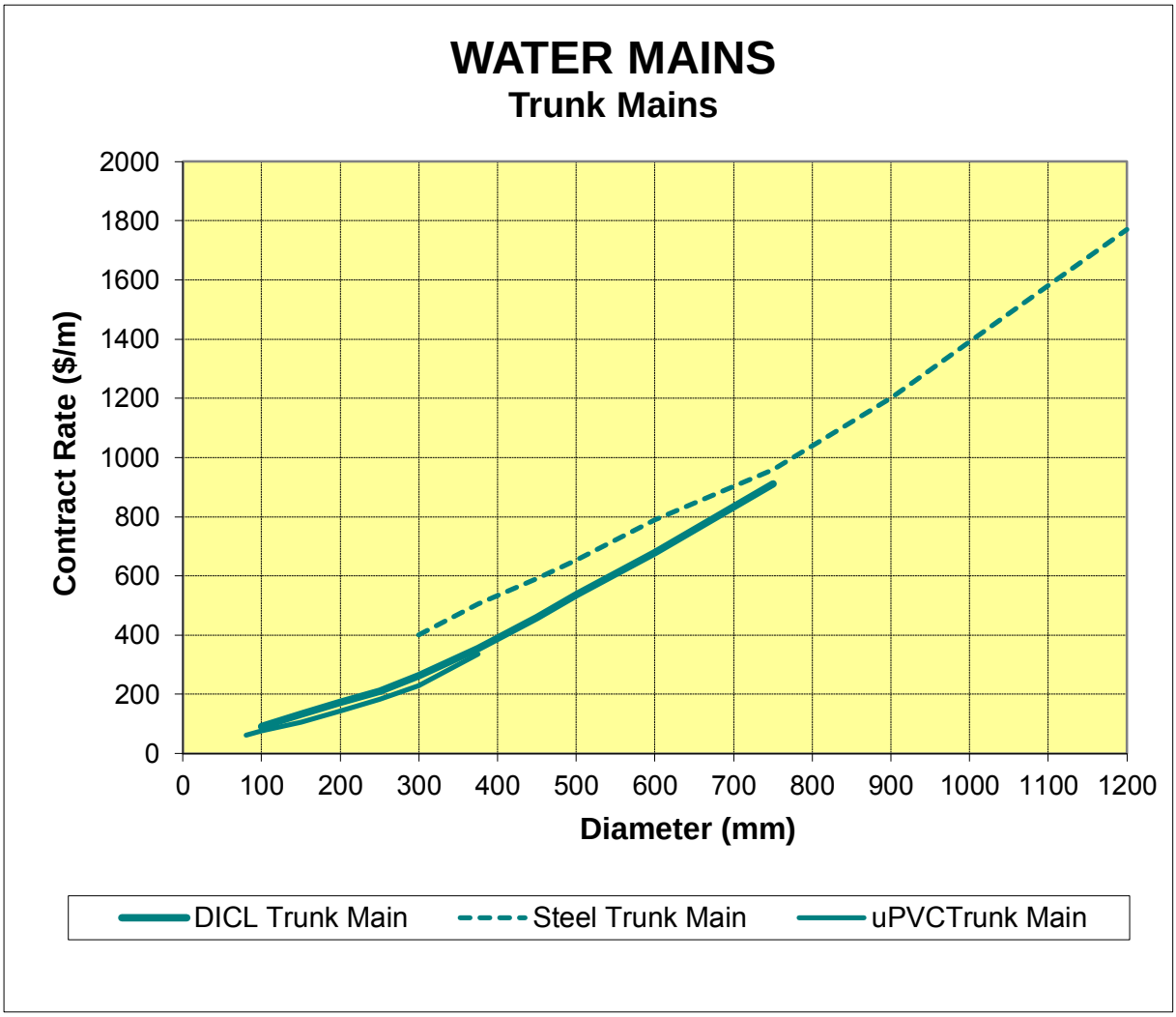

Figure 19 Water Mains - Trunk Mains (June 2014$)

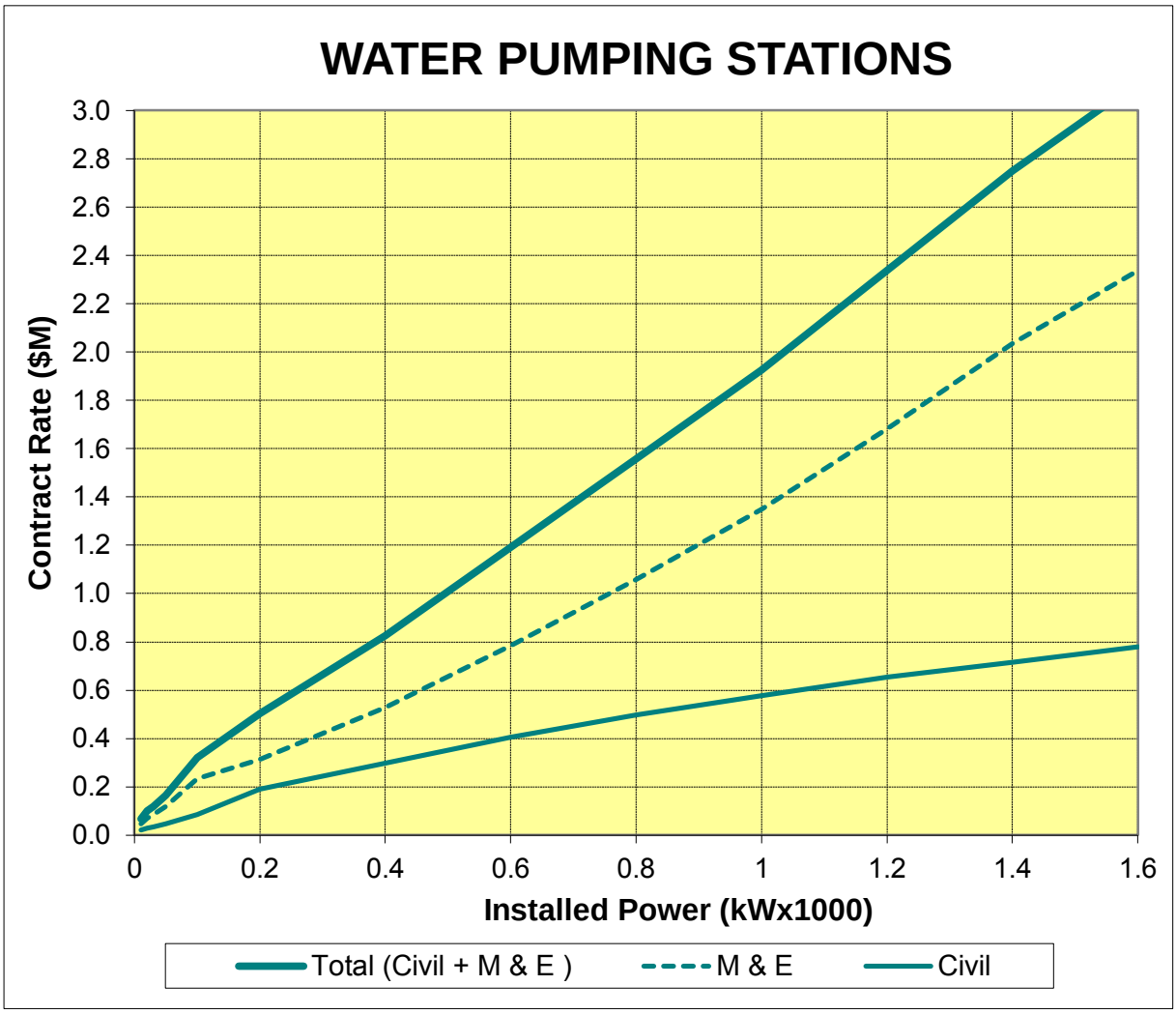

Figure 20 Water Pumping Stations (June 2014$)

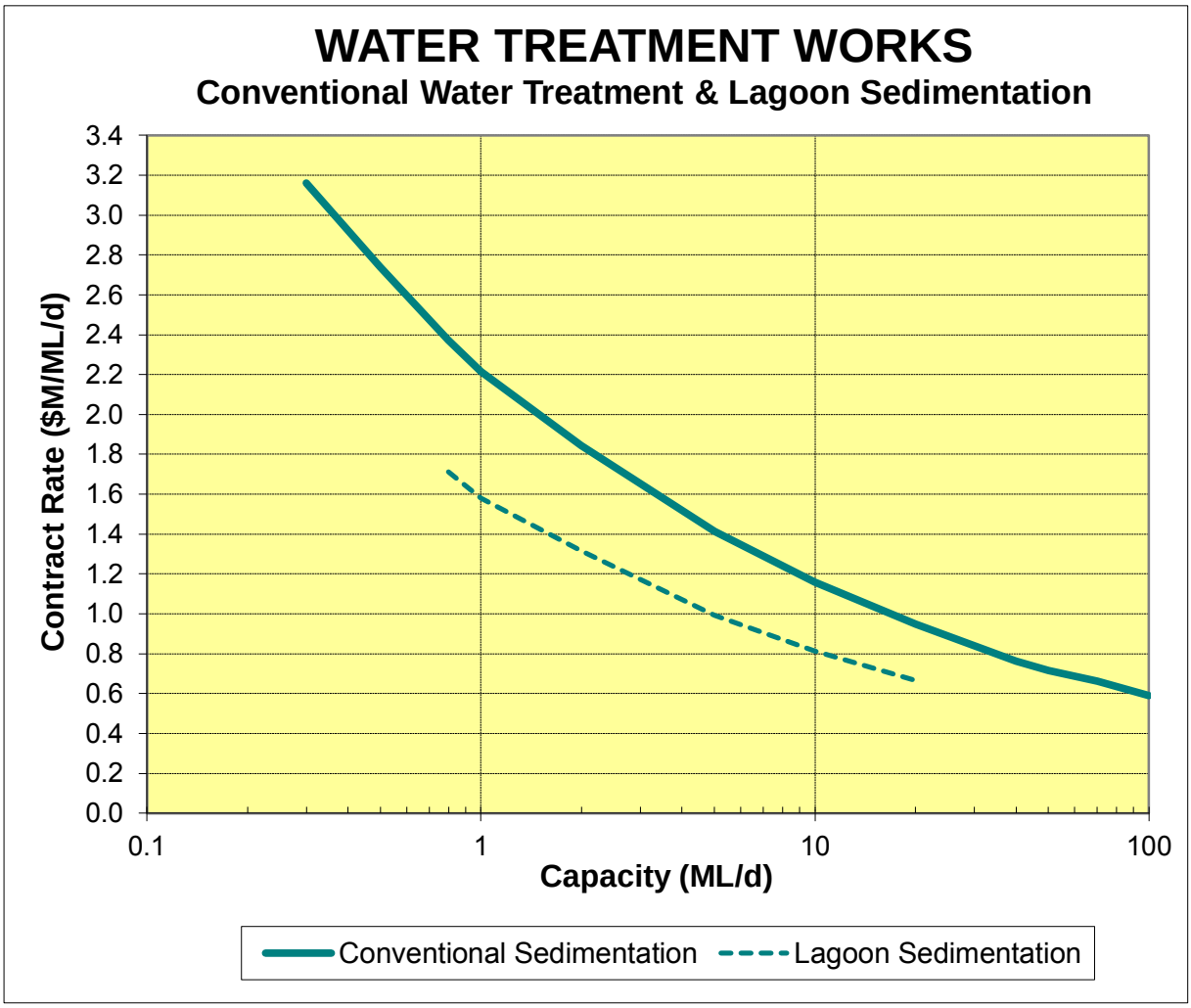

Figure 21 Water Treatment Works – Conventional Water Treatment and Lagoon Sedimentation (June 2014$)

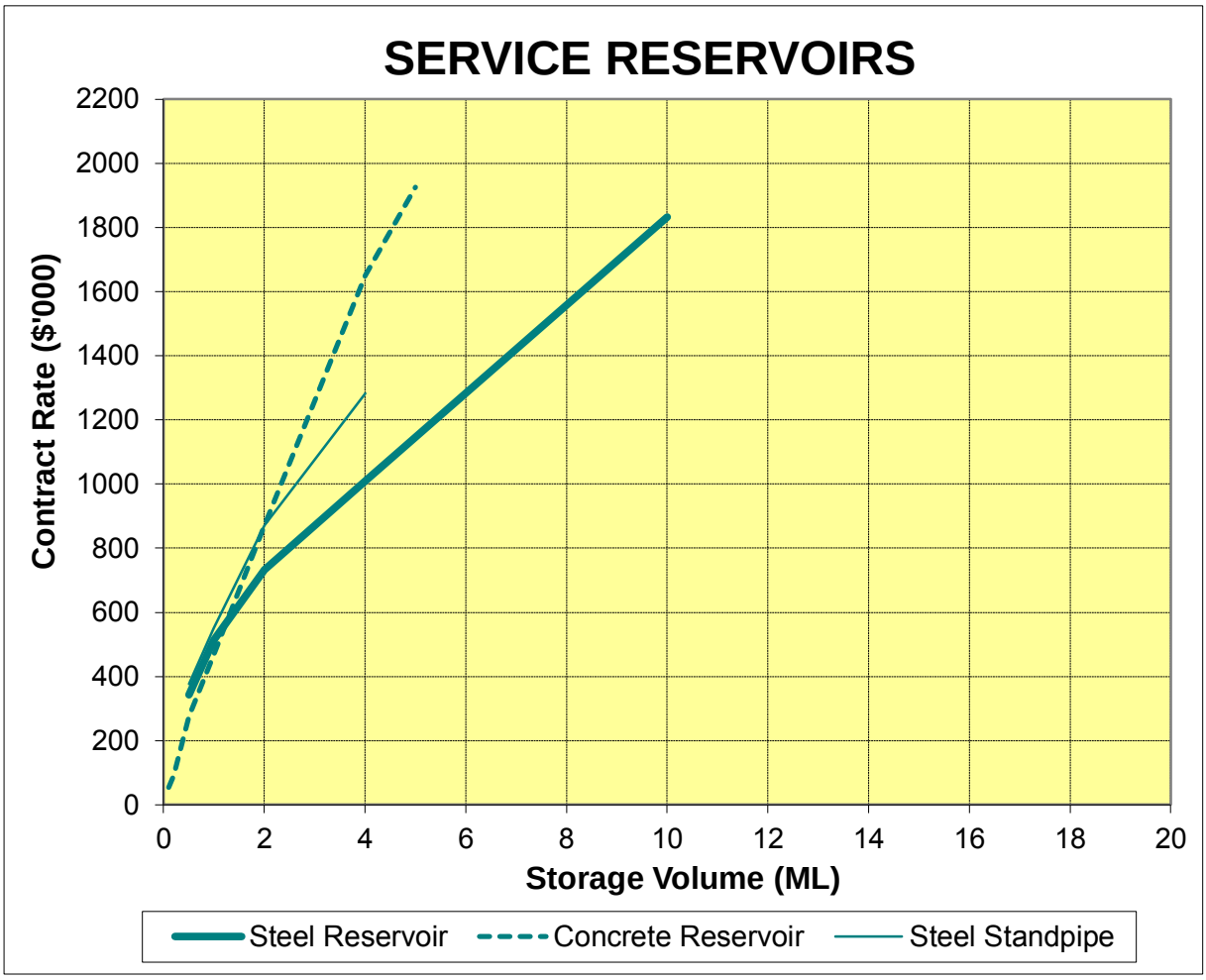

Figure 22 Service Reservoirs (June 2014$)

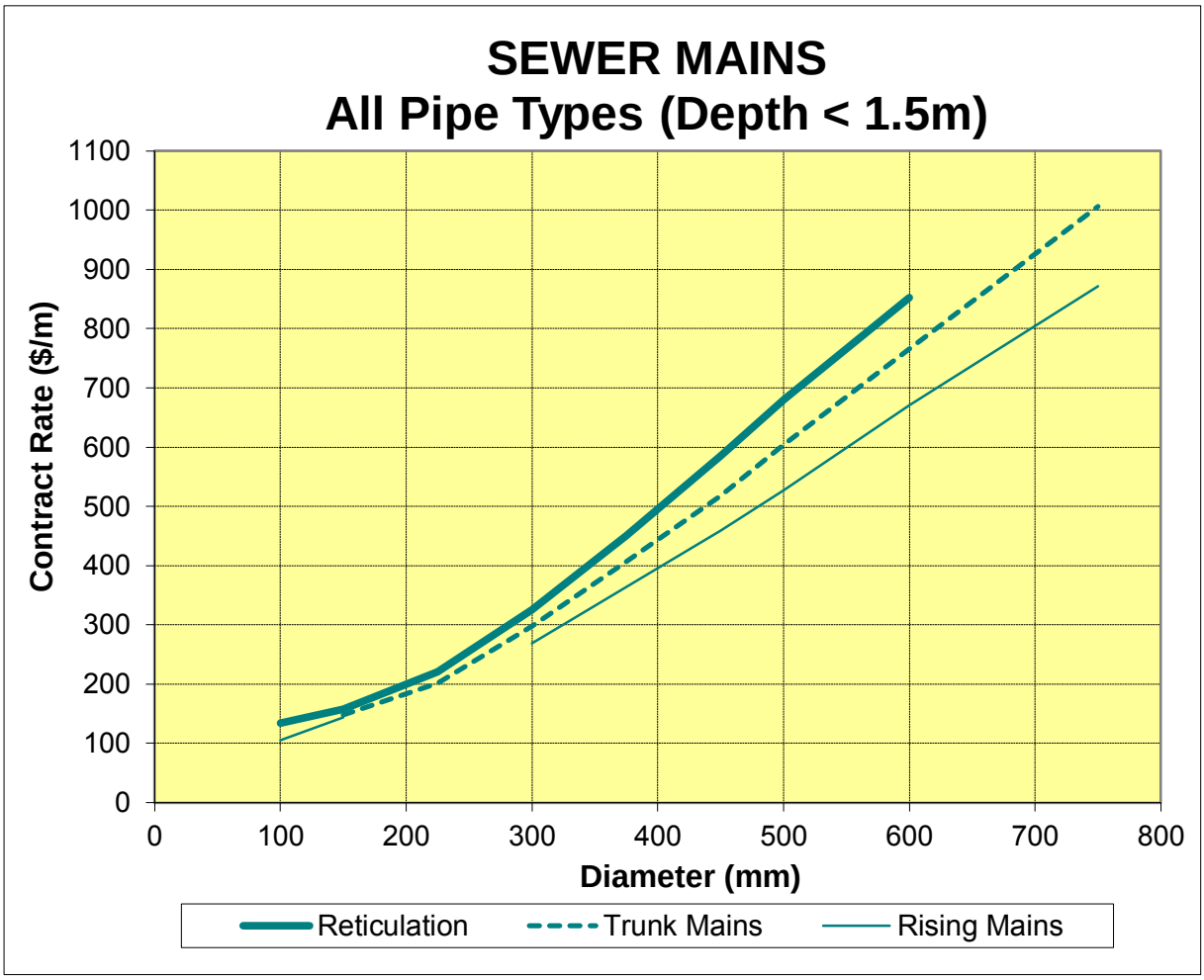

Figure 23 Sewer Mains (June 2014$)

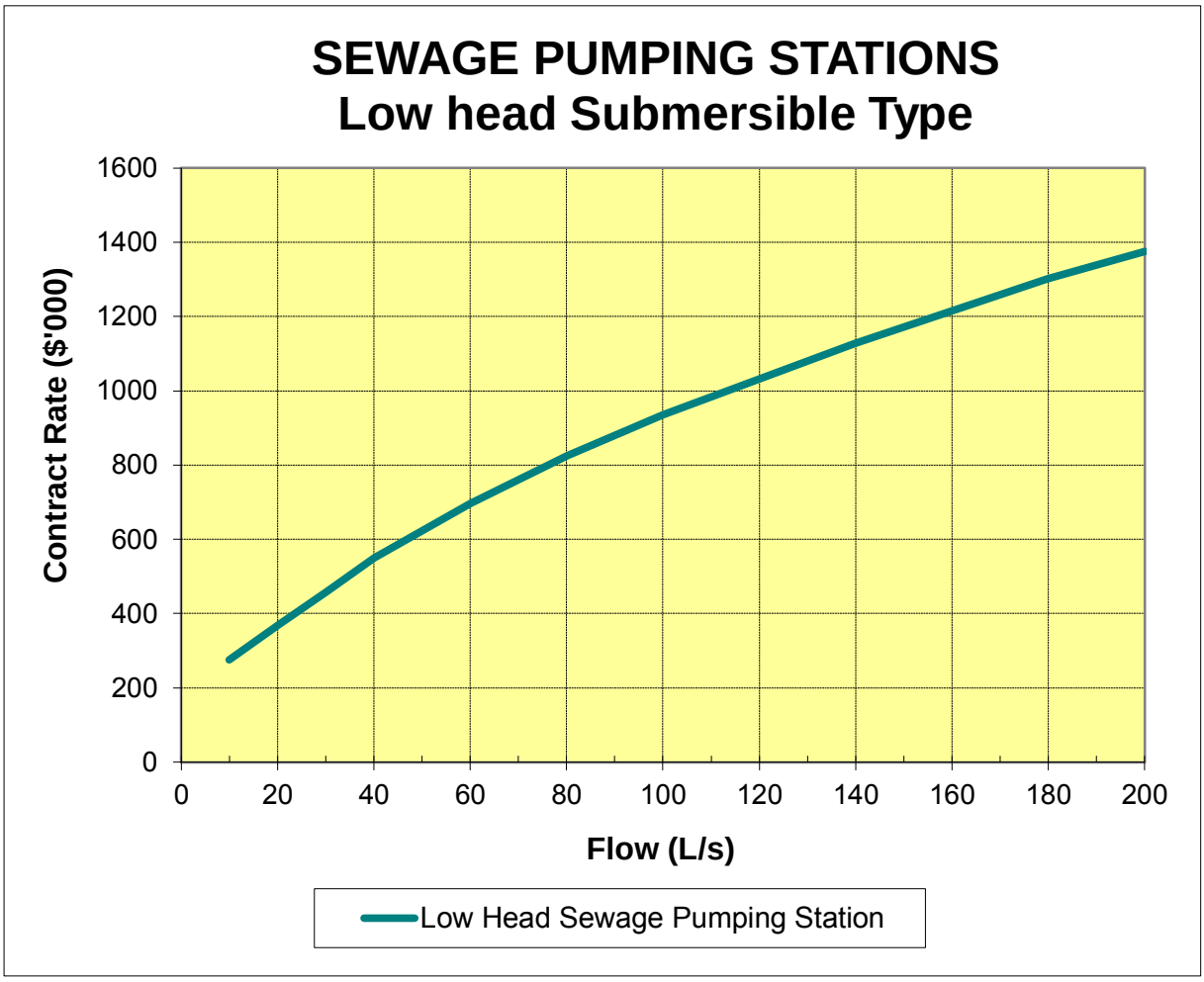

Figure 24 Sewage Pumping Stations – Low Head (up to 50m) Submersible Type (June 2014$)

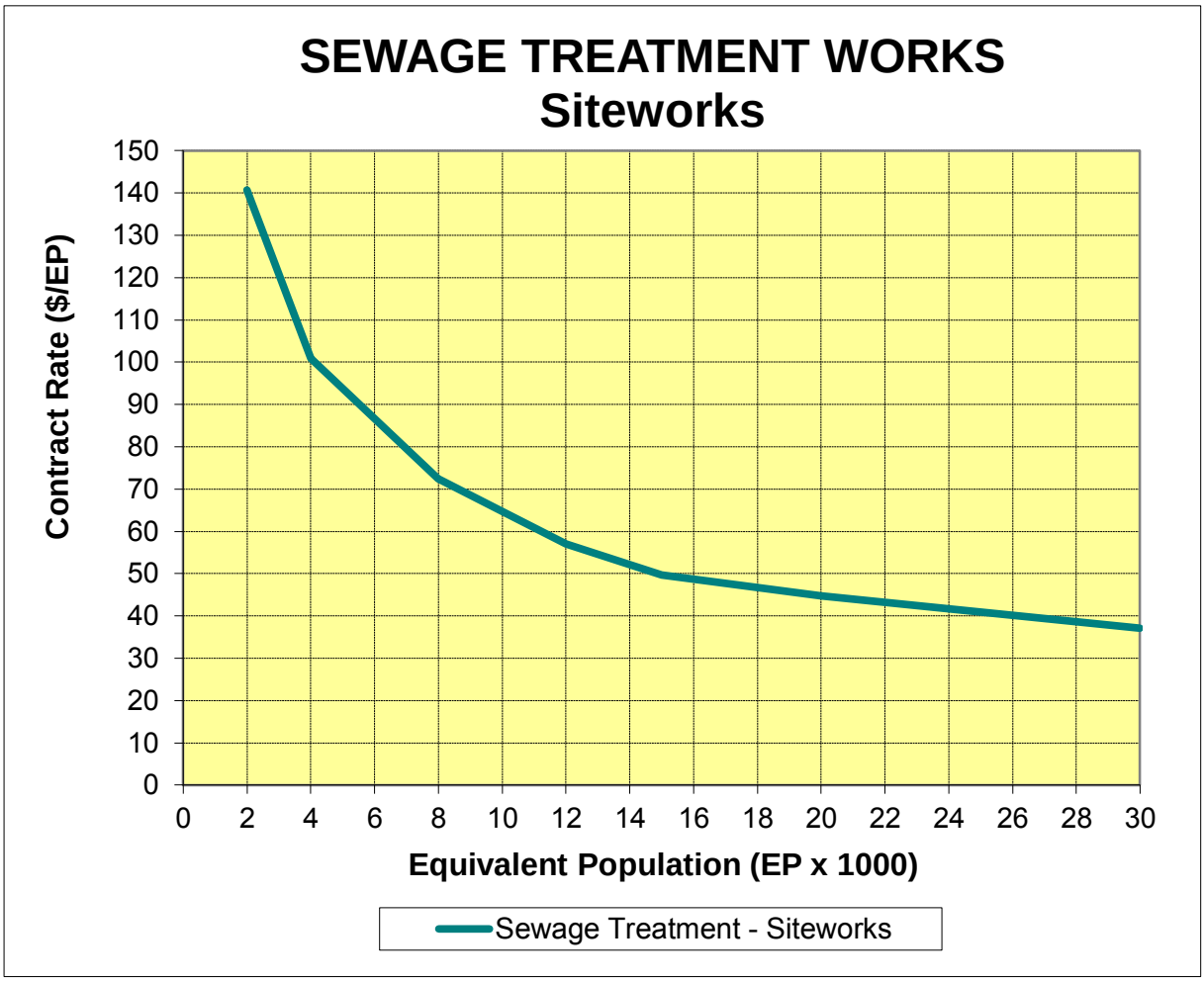

Figure 25 Sewage Treatment Works – Siteworks (June 2014$)

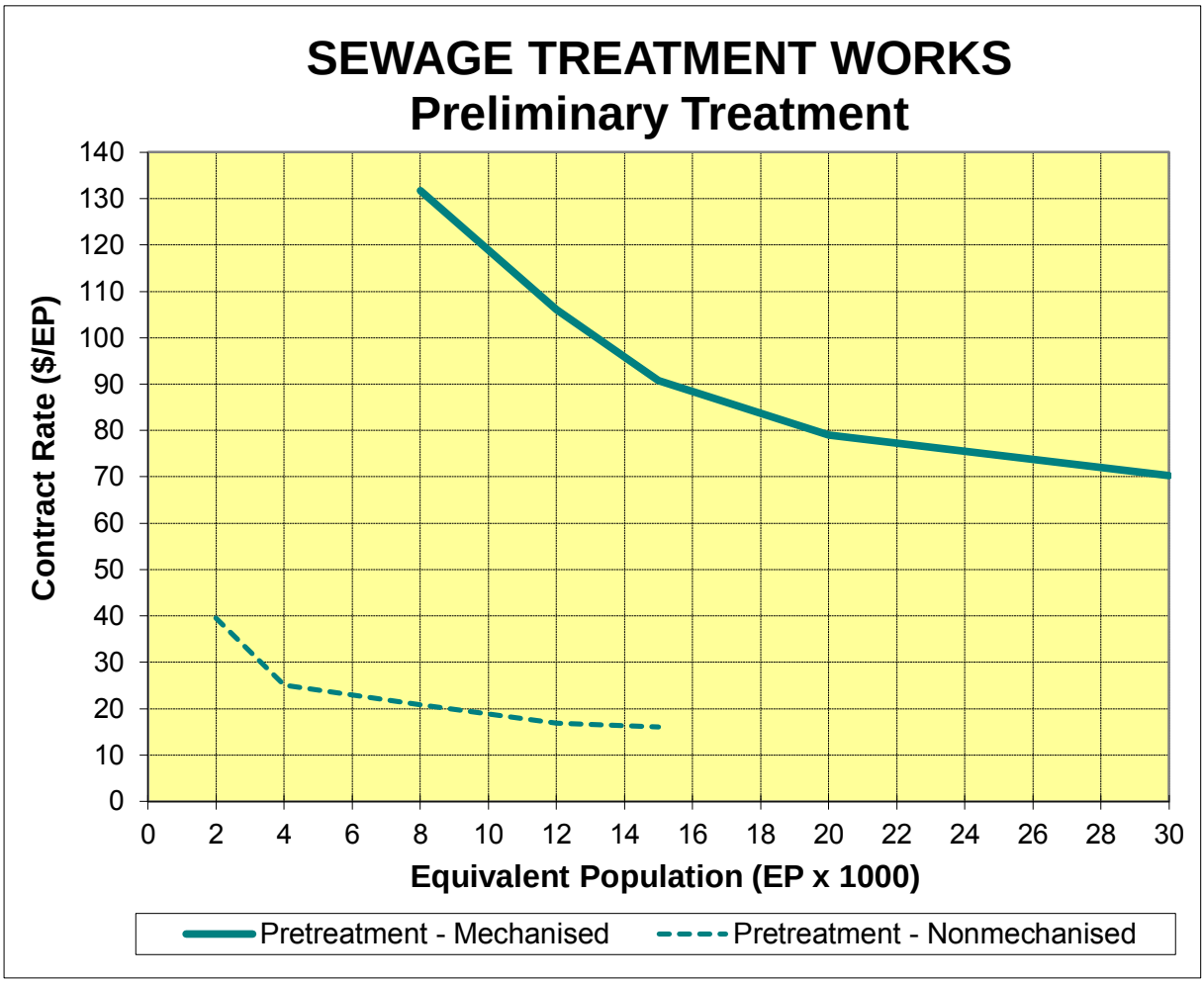

Figure 26 Sewage Treatment Works – Preliminary Treatment (June 2014$)

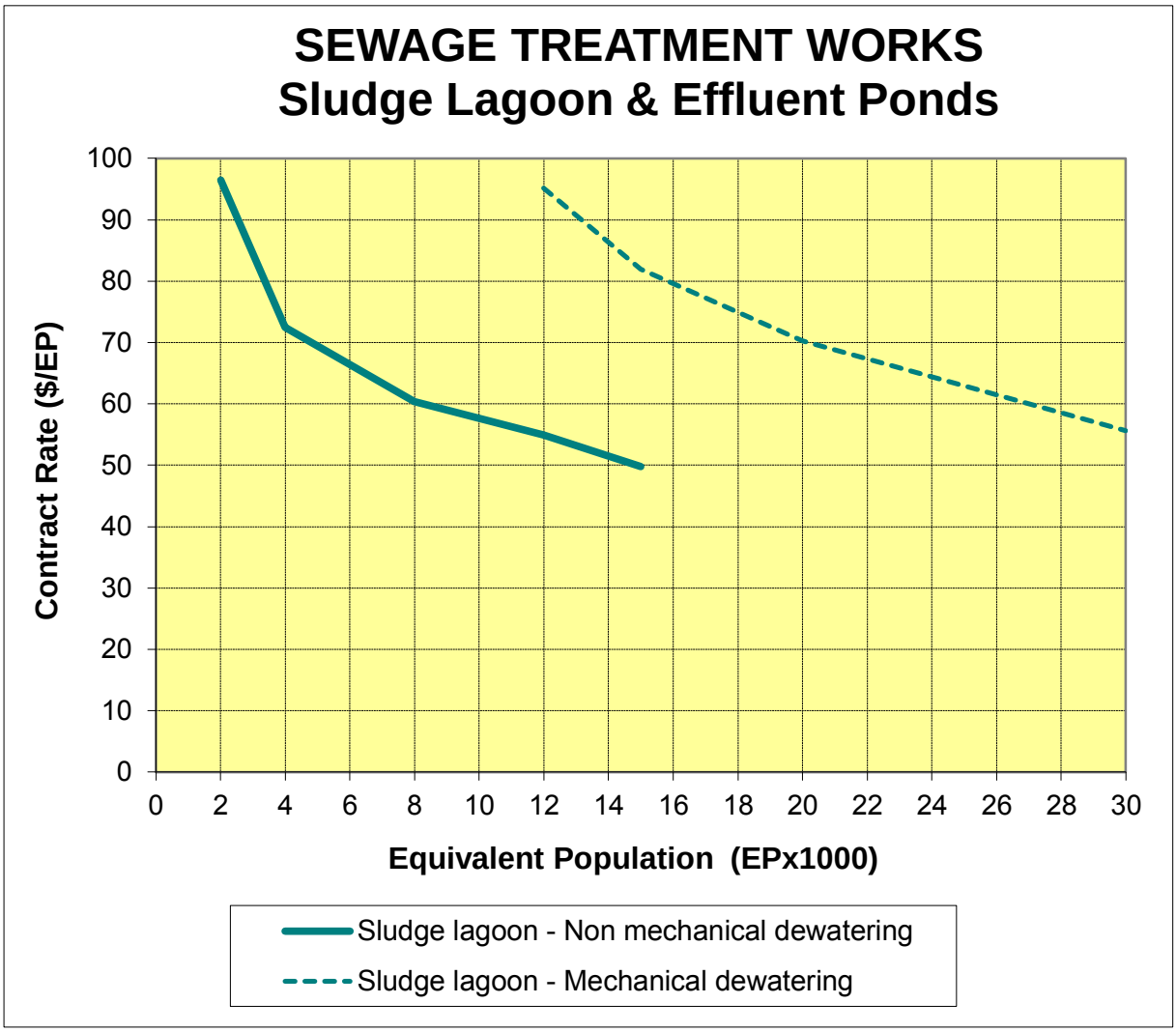

Figure 27 Sewage Treatment Works – Sludge Lagoon and Effluent Ponds (June 2014$)

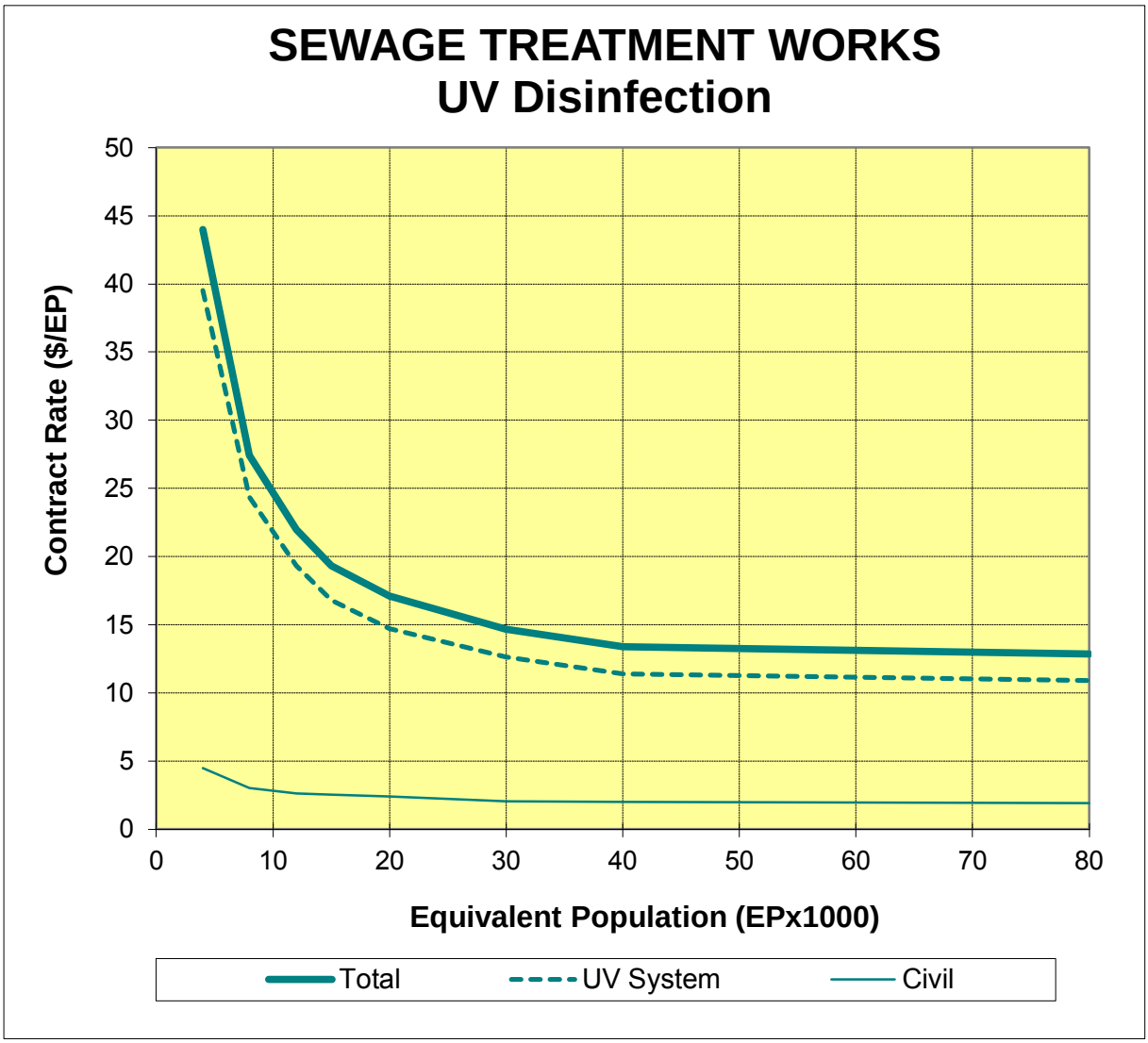

Figure 28 Sewage Treatment Works – UV Disinfection (June 2014$)

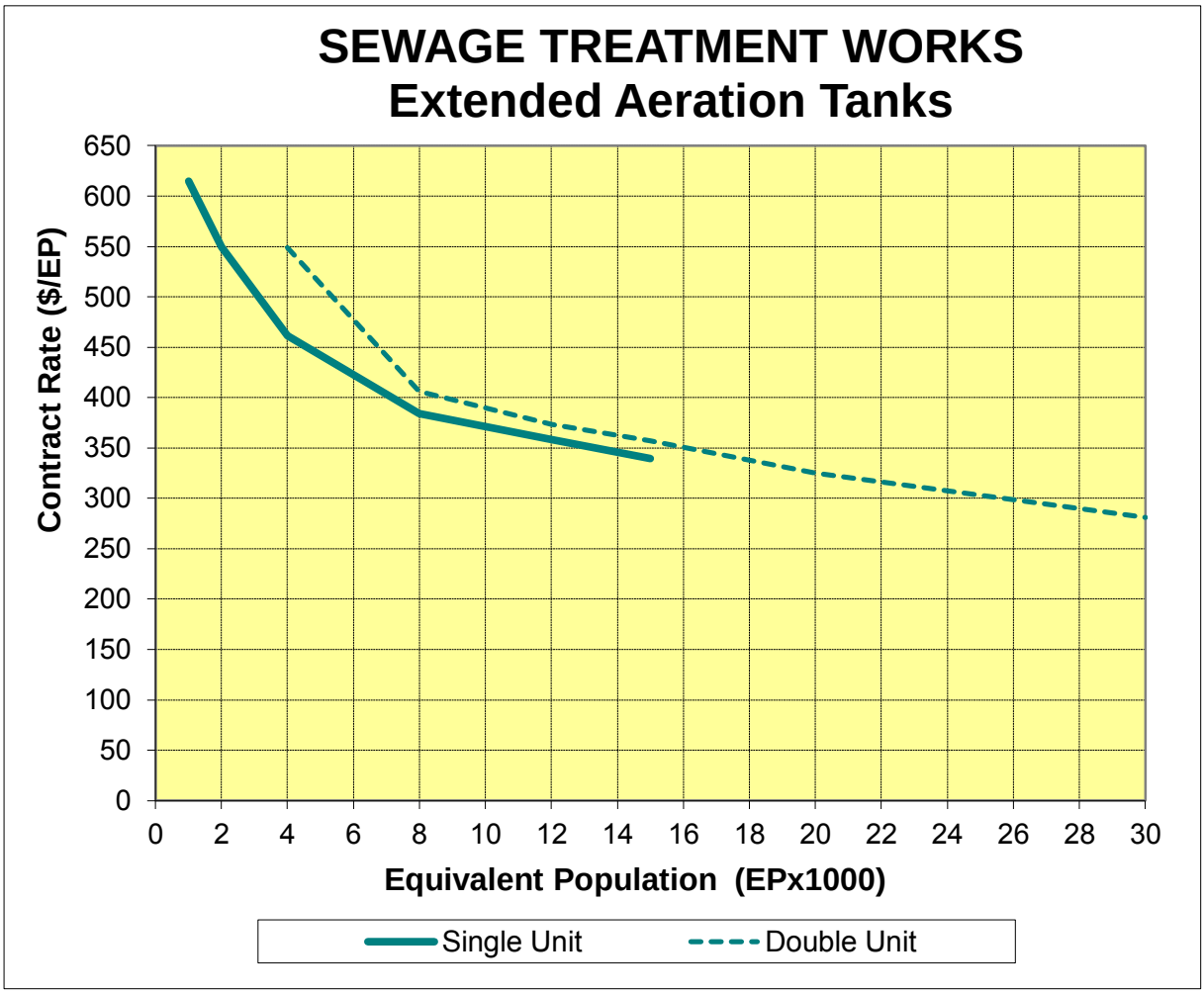

Figure 29 Sewage Treatment Works – Extended Aeration Tanks (June 2014$)

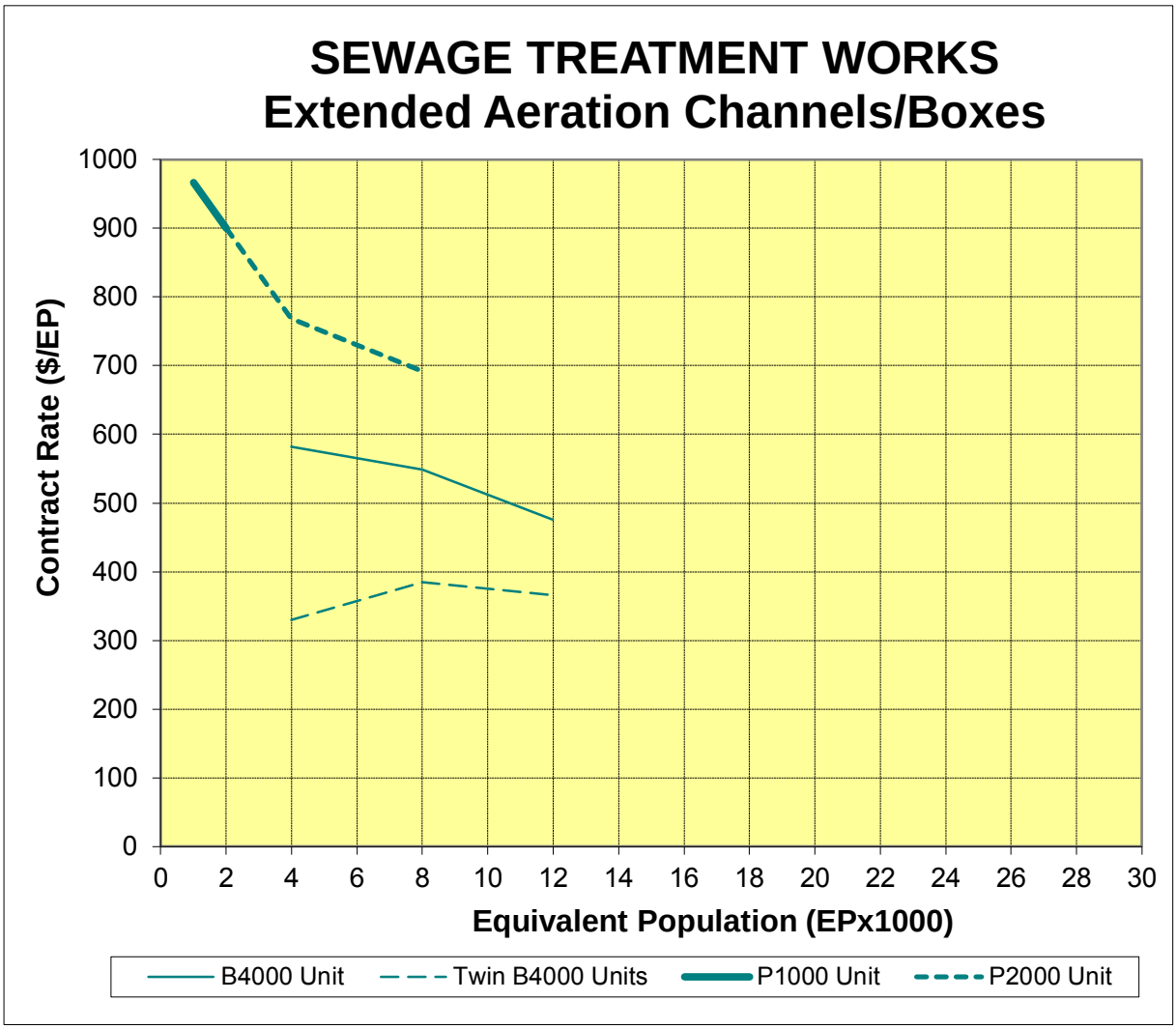

Figure 30 Sewage Treatment Works – Extended Aeration Channels/Boxes (June 2014$)

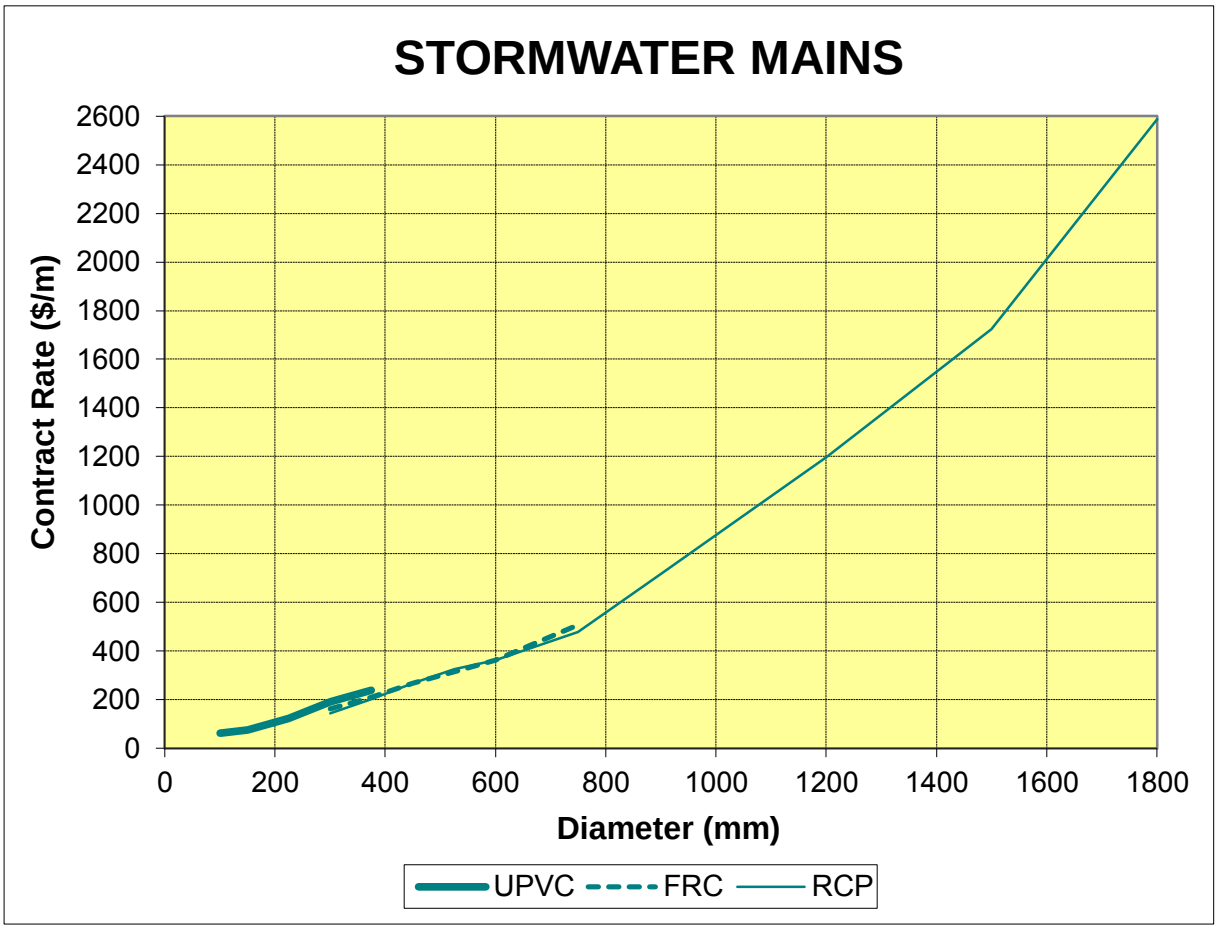

Figure 31 Stormwater Mains (June 2014$)

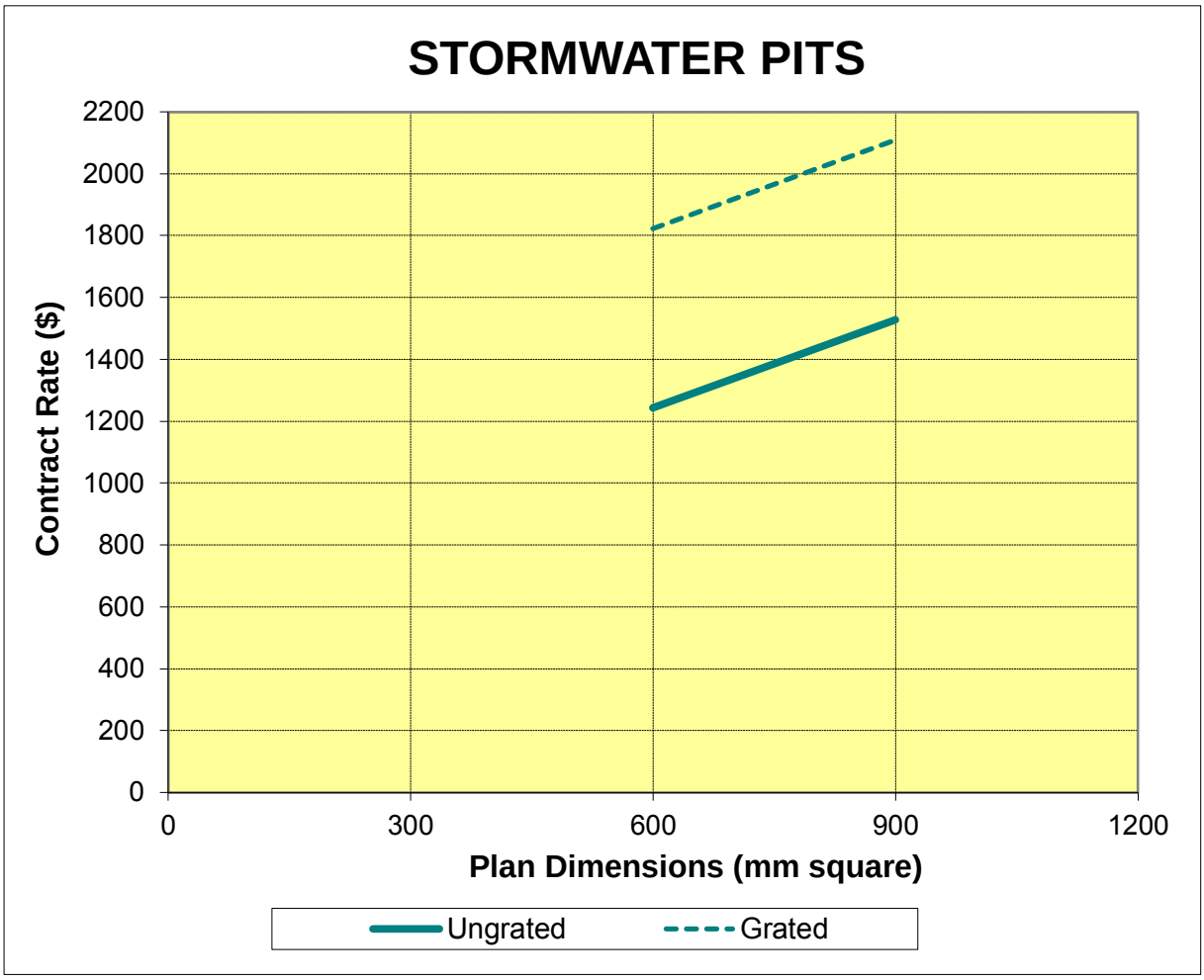

Figure 32 Stormwater Pits (June 2014$)

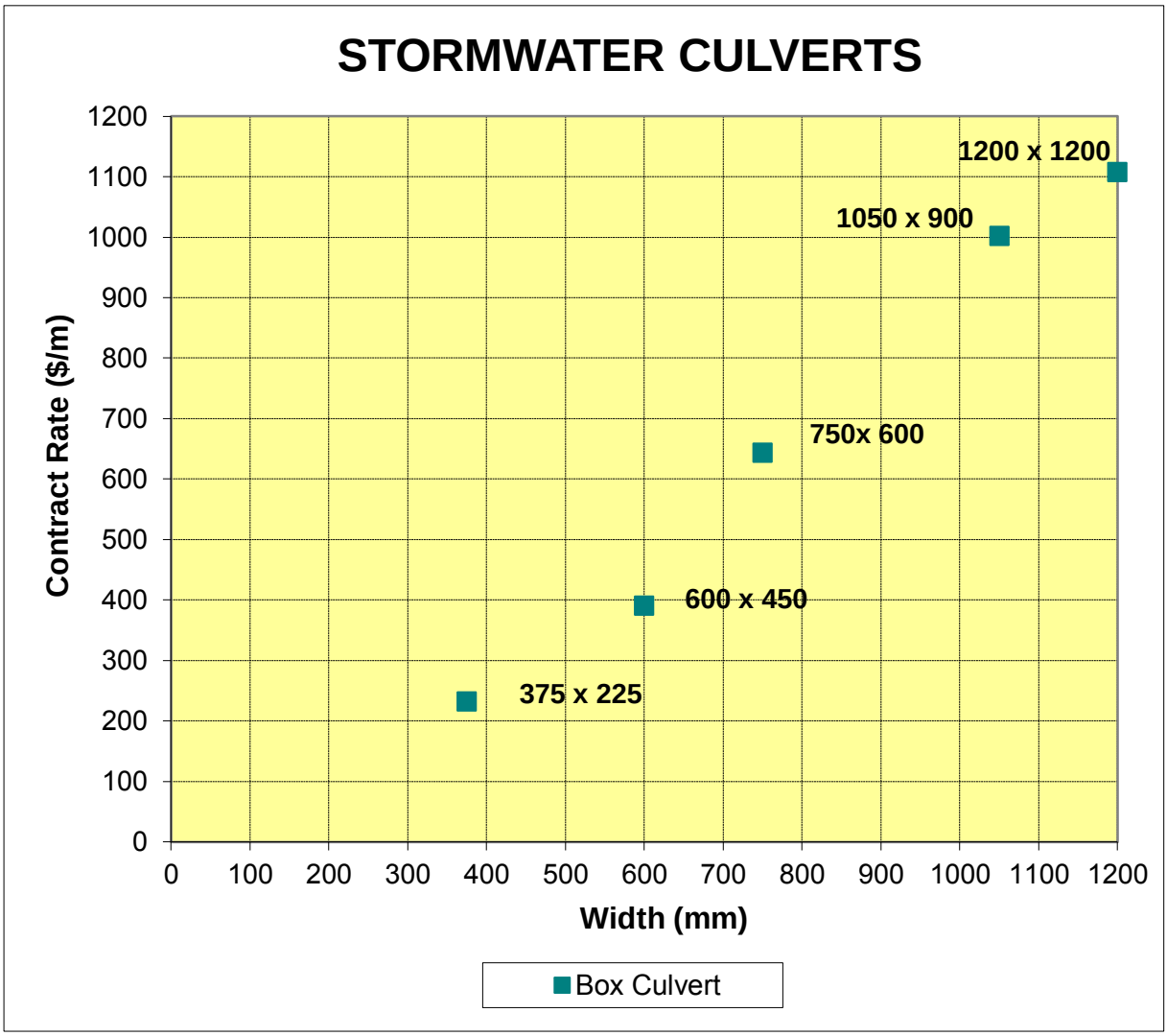

Figure 33 Stormwater Culverts (June 2014$)

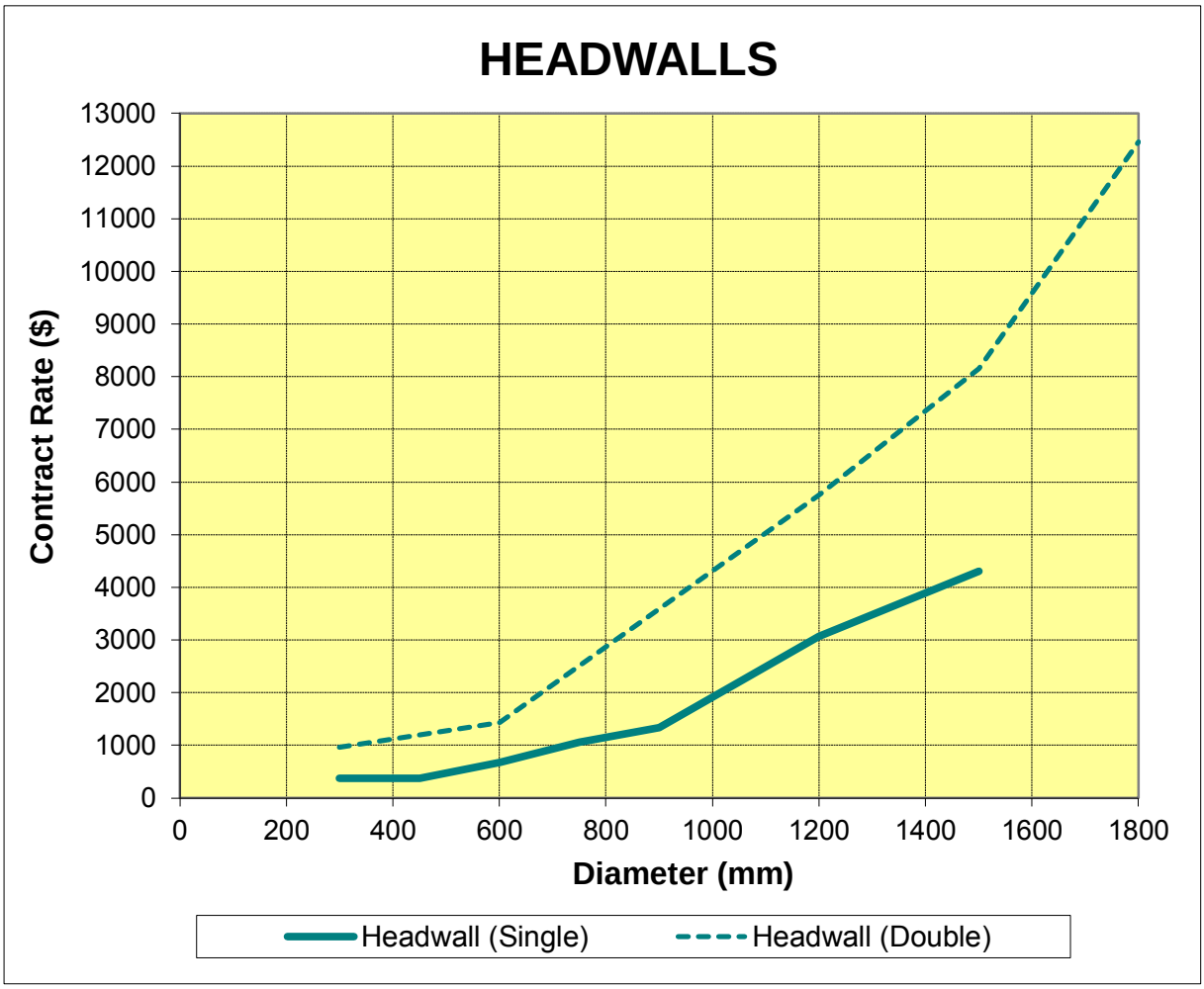

Figure 34 Headwalls (June 2014$)

Attachment 1
NSW Water Supply & Sewerage Construction Cost Indices

June 2014 Update - NSW Water Supply and Sewerage Construction Cost Indices

(based on indices at June of each year)

Year	Capital Cost Factor	Construction Cost Index (%pa) (excl. GST)
2014	1.00	
2013	1.028	2.8%
2012	1.054	2.5%
2011	1.08	2.5%
2010	1.11	3.2%
2009	1.15	3.0%
2008	1.18	3.0%
2007	1.24	5.0%
2006	1.31	5.9%
2005	1.42	8.1%
2004	1.50	5.3%
2003	1.56	4.2%
2002	1.64	5.0%
2001	1.72	5.1%
2000	1.74	1.0%
1999	1.80	3.3%
1998	1.82	1.3%
1997	1.84	1.0%
1996	1.84	0.3%
1995	1.91	3.9%
1994	1.97	3.0%
1993	2.01	1.9%
1992	2.05	1.8%
1991	2.07	1.0%
1990	2.12	2.8%
1989	2.30	8.1%
1988	2.48	8.0%
1987	2.71	9.2%
1986	2.92	7.9%
1985	3.13	7.1%
1984	3.36	7.5%
1983	3.61	7.2%
1982	3.89	8.0%
1981	4.63	18.8%
1980	5.01	8.2%
1979	5.38	7.4%
1978	5.72	6.3%
1977	6.20	8.4%
1976	6.95	12.2%
1975	8.09	16.4%
1974	9.72	20.1%

Year	Capital Cost Factor	Construction Cost Index (%pa) (excl. GST)
1973	11.4	17.2%
1972	12.6	10.4%
1971	13.8	9.8%
1970	14.7	6.6%
1969	15.5	5.0%
1968	16.4	6.3%
1967	17.0	3.6%
1966	17.5	3.0%
1965	18.2	3.9%
1964	18.6	2.4%
1963	18.7	0.4%
1962	18.9	1.0%
1961	19.2	1.4%
1960	19.8	3.4%
1959	20.2	1.7%
1958	20.5	1.8%
1957	21.0	2.2%
1956	22.3	6.2%
1955	22.8	2.4%
1954	22.9	0.5%
1953	24.0	4.6%
1952	28.2	17.4%
1951	33.6	19.3%
1950	36.7	9.4%
1949	40.2	9.4%
1948	44.4	10.4%
1947	46.1	3.9%
1946	47.0	2.0%
1945	47.0	0.0%
1944	47.1	0.2%
1943	48.5	2.9%
1942	52.9	9.0%
1941	55.3	4.7%
1940	57.4	3.7%
1939	58.8	2.5%
1938	60.4	2.6%
1937	62.8	4.0%
1936	63.6	1.4%
1935	64.5	1.4%

Note

To update a June 2009 capital cost to June 2014, multiply by 1.15, which is the capital cost factor shown in the above table for 2009.

The NSW Office of Water provides annual updates of this Attachment 1 of the NSW Reference Rates Manual to facilitate asset valuations using an index based on the capital cost factor derived from various sources including data published by the Australian Bureau of Statistics (ABS).

Year	Capital Cost Factor	Construction Cost Index (%pa) (excl. GST)
1934	66.3	2.8%
1933	63.6	-4.1%
1932	60.4	-5.1%
1931	54.2	-10.3%
1930	51.8	-4.4%
1929	52.9	2.2%
1928	52.9	0.0%
1927	52.3	-1.1%
1926	53.5	2.3%
1925	53.5	0.0%
1924	53.0	-1.1%
1923	54.2	2.3%
1922	52.4	-3.3%
1921	52.6	0.4%
1920	51.8	-1.5%
1919	58.9	13.7%
1918	62.8	6.7%
1917	66.4	5.6%
1916	67.3	1.4%
1915	77.2	14.7%
1914	79.8	3.4%
1913	79.8	0.0%
1912	88.8	11.3%
1911	90.5	1.9%
1910	92.3	2.0%
1909	92.3	0.0%
1908	98.1	6.3%
1907	98.1	0.0%
1906	98.1	0.0%
1905	102.4	4.3%
1904	96.1	-6.1%
1903	94.2	-2.0%
1902	100.2	6.4%
1901	100.8	0.6%
1900	104.3	3.4%
1899	106	2.0%
1898	108	2.0%
1897	111	2.0%
1896	113	2.1%
1895	115	1.9%
1894	117	2.0%
1893	120	2.0%
1892	122	2.0%
1891	125	2.0%
1890	127	2.0%
1889	130	2.0%
1888	132	2.0%
1887	135	2.0%
1886	131	-2.8%

Attachment 2
Indicative Useful Lives of Assets

Water Supply and Sewerage Assets

WATER SUPPLY			
Dams	-	structure	100 years
	-	mechanical & electrical	25 years
Bores	-		30 years
Treatment Works	-	structure	70 years
	-	mechanical & electrical	30 years
Pumping Stations	-	structure	50 years
	-	mechanical & electrical	25 years
Mains	-	new	80 years
	-	relined mains	50 years
River Intakes	-		20 years
Reservoirs	-	structure	100 years
	-	roof	40 years
SEWERAGE			
Treatment Works	-	structure	50 years
	-	mechanical & electrical	20 years
Pumping Stations	-	structure	70 years
	-	mechanical & electrical	25 years
Access Chambers	-	structure	70 years
	-	ladder	25 years
Mains	-	AC pipes	45 pipes
	-	VC pipes	70 years
	-	UPVC pipes	70 years
	-	concrete pipes	45 years
	-	DI pipes	40 years
	-	relined pipes	50 years
Others	-	odour control	20 years

Stormwater Assets

Channels	30 years
Culverts	60 years
Flood Control Structure	100 years
Pits	30 years
Retarding Basins	100 years

Index