

19 October 2011

Amanda Chadwick  
Director Water  
Sydney Water Corporation Price Review 2012  
Independent Pricing and Regulatory Tribunal  
PO Box Q290  
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Dear Amanda

The Australian Sustainable Business Group (ASBG) welcomes the opportunity to provide comment on the Independent Pricing and Regulatory Tribunal's (IPART) *Sydney Water Corporation Price Review 2012* which also includes elements of the *Review of Price Structures for Metropolitan Water Utilities*.

The Australian Sustainable Business Group (ASBG) is a leading environment and energy industry representative body that specialises in providing the latest information, including changes to environmental legislation, regulations and policy that may impact industry, business and other organisations. We operate in NSW and Queensland and have over 130 members comprising of Australia's largest manufacturing companies.

Water and sewer pricing are an important cost and utility service for business and industry. Keeping such services reliable and low in cost assists NSW businesses to remain competitive in the national and international markets. Given the current high Australian dollar and increasing competition NSW industry needs every cost advantage it can receive to slow its shrinkage rate. For example, the water prices for Shanghai are 2.8 yuan/kL<sup>1</sup> (\$0.43/kL) which makes Sydney Water's current price 4.2 times higher rising to over 5 times in 2015-16. Hence, having an efficient, highly productive water service is important for the continuing future of industry in NSW recognising that Sydney Water's industrial customers have much higher water utility prices than its main international competitors.

The main issues covered in this submission on Sydney Water's pricing include:

- **Water pricing**

Given the highly stressed economic conditions surrounding Sydney's industry ASBG recommends that IPART continue its program of ensuring efficiency improvement and productivity gains within Sydney Water.

- **Sewer Usage charges**

ASBG welcomes any lowering of a utility charging rate, but is concerned of the need to increase other charges to maintain similar revenue levels and these impacts.

<sup>1</sup> See [http://www.china.org.cn/government/local\\_governments/2009-04/28/content\\_17684825.htm](http://www.china.org.cn/government/local_governments/2009-04/28/content_17684825.htm)

- **Trade waste charges:**

ASBG recommends that IPART require Sydney Water use a transitional pricing structure to introduce the new trade waste charges over a period of 4 years.

- **BOD**

Continue to use a similar linear pricing system for BOD rather than the proposed flat rate. BOD onsite treatment is costs are high and limited due to scarcity of land for many customers.

- **Temperature**

This is a new charge and few customers are able to assess its cost impacts. Temperature reduction is high in cost and customers will likely find it lower in cost to pay the additional charge. ASBG suggests that temperature could be exponentially based to reflect its true costs on Sydney Water's pipes.

- **pH**

pH is the lowest cost treatment and most likely to be implemented. Having a linear charge for an exponentially measured parameter, makes little sense.

- **Using pH for Off-set credits**

As pH is the lowest treatment cost for customers, Sydney Water should reward customers for provision of higher pH, up to its upper limit. Provision of credits for pH above the minimum may result in considerable reductions in sewer corrosion and odour generation.

ASBG recommends that a new pricing formula for pH be also used as an off-set payment for customers providing pH above 7 (the lower limit) up to 10, (its upper limit).

## **WATER PRICING**

Sydney Water's proposal for a 15% real increase in water prices over the next four year pricing period is considerable. Sydney Water bases a considerable proportion of this price increases on external cost pressures and a considerable CAPX. The long term security of water supply is very important to Sydney Water dependent industry and businesses. According to IPART's report, OPEX is approximately 1.2 times that of the CAPX and is an area where higher efficiencies can be expected to be gained.

However, given the current business conditions of a high dollar and stressed manufacturing sector, water prices require tight control. Sydney based industry has shrunk considerably over the last 12 or so years. In the late 1990s Sydney Water reported that there were over 1,500 industrial trade waste agreements. Today that figure has shrunk to less than 750, with the main growth area being in the remediation of contaminated sites using contaminated groundwater pump, treat and send to sewer systems.

***Given the highly stressed economic conditions surrounding Sydney's industry ASBG recommends that IPART continue its program of ensuring efficiency improvement and productivity gains within Sydney.***

In this context we ask IPART to consider the efficiency gains that have been required on Sydney Water's major industrial customers and how this compares to that of Sydney Water's performance.

## SEWER USAGE CHARGES

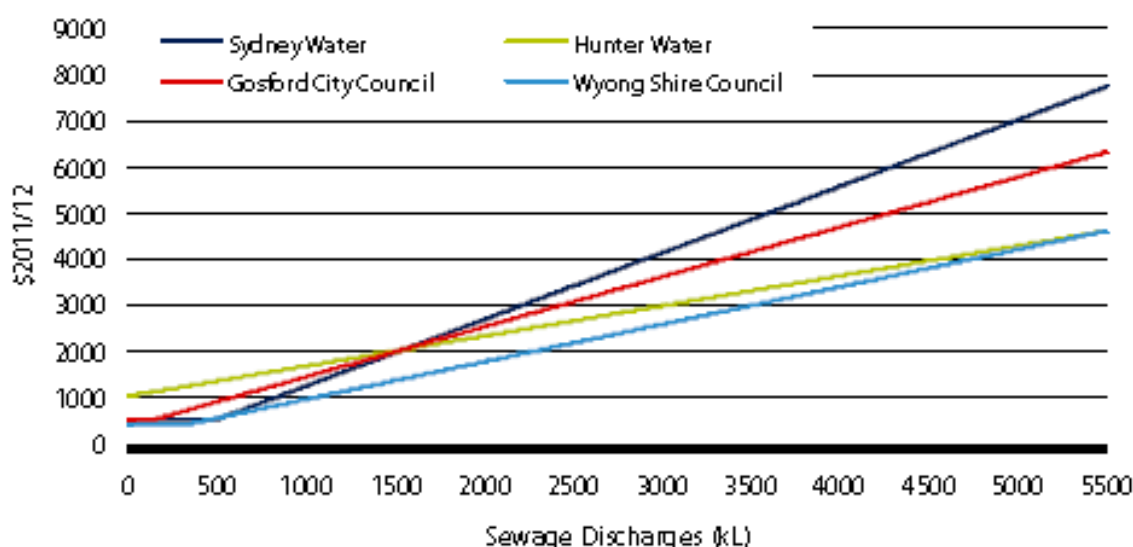
IPART's Review of Price Structures for Metropolitan Water Utilities, identifies a considerable variation between water agencies within the greater Sydney Basin on volume discharge costs to sewer. Below are the figures taken from the report which shows this pricing variation.

**Table 4.3 Non-residential sewerage usage prices (2011/12 dollars)**

	Sydney Water	Hunter Water	Gosford City Council	Wyong Shire Council
Service charge (20mm)	\$540 x df <sup>3</sup>	\$1,042 x df <sup>3</sup>	\$380 x df <sup>3</sup>	\$162 x df <sup>3</sup>
Usage charge (\$/kL)	\$1.49	\$0.65	\$1.08	\$0.81
Free usage threshold (kL)	500	0	0	0

<sup>3</sup> Sewerage flows are difficult and expensive to meter. An assessment of the percentage of water consumed that is discharged to the sewerage system is made for the business. Therefore sewerage usage is estimated as water consumed multiplied by the discharge factor.

**Figure 4.1 Non-residential sewage charges (2011/12 dollars)**



Note: Assumed 100% discharge factor for comparison purposes.

Source: Various determinations.

Sydney Water's industrial and commercial customers, especially the higher water users, pay a much higher Sewer Usage Charge (SUC) compared to other local water utilities. While ASBG would welcome a review of the SUC charge to bring it in line with actual costs, the difficulty is what other costs Sydney Water will increase in order to regain this lost revenue stream. Blended in this is the higher proportion of industrial discharges within Sydney Water's area compared to the other local water utilities. In addition, ASBG also agrees with IPART's position of customers being charged for the service they receive and a push towards removing cross subsidization. As a consequence, ASBG would need to assess the knock on cost impacts in other areas, especially on trade waste charges, should the SUC be set at a lower rate. Given that Sydney Water's submission to IPART did not include changes to the SUC, IPART could re-approach Sydney Water to resubmit the changes to its pricing policies should a lower SUC be set.

## TRADE WASTE CHARGES

The arguments put forward by Sydney Water for additional revenue from trade waste appears on the surface a strong argument. However, it does propose substantial pricing changes to its trade waste policy which will result in considerable variations in cost impacts among industrial customers. While the increase in overall trade waste revenue is about \$7.85m is not large, it hides the swings of billing rates among customers, will be far higher than the revenue increase suggests. Under the proposal there are winners and losers in the proposed pricing scheme, the main impacts will hit a proportion of the 750 industrial trade waste customers with substantial cost increases. While there will be companies receiving bill reductions, it is those with large increases which concerns ASBG. The tables below are Sydney Water's list of proposed trade waste charges.

ASBG also welcomes the dropping of many of the substance charges and the lowering of suspended solids and grease charges for primary treatment. In general for the smaller trade waste customers a simpler charge system has administrative benefits.

Rearranging the risk index site visitations is also welcomed with the corresponding lower administrative charges on customers. Overall a simpler charge system offers lower administrative costs to customers and mainly to Sydney Water. In terms of red tape (green tape) reduction this is a step in the right direction. However, there is always a danger that a simpler system is less flexible and introduces more cross subsidization between customers, by not accurately charging the customer the costs which best reflects the costs on Sydney Water. A compromise must be met, and ASBG has put forward some arguments in this submission to improve some of the accuracy of the charge to cost elements Sydney Water has proposed as the move to simply appears to have gone a bit too far.

**Table 22.11 Proposed pollutant charges– Industrial customers (\$ 2011-12)**

Charge	Units	2012-13	2013-14	2014-15	2015-16
BOD - primary WWTPs	\$/kg of mass above domestic strength	0.427	0.435	0.437	0.439
BOD - secondary and tertiary WWTPs	\$/kg of mass above domestic strength	1.774	1.807	1.816	1.823
SS - primary WWTPs	\$/kg of mass above domestic strength	0.445	0.454	0.456	0.458
SS - secondary and tertiary WWTPs	\$/kg of mass above domestic strength	1.288	1.313	1.319	1.324
Grease - primary WWTPs	\$/kg of mass above domestic strength	0.401	0.409	0.411	0.412
Grease - secondary and tertiary WWTPs	\$/kg of mass above domestic strength	1.231	1.254	1.260	1.265
Nitrogen – secondary/ tertiary WWTP only	\$/kg of mass above domestic strength	1.460	1.487	1.495	1.500
Phosphorous – secondary/ tertiary WWTP only	\$/kg of mass above domestic strength	5.232	5.330	5.356	5.377
pH – all WWTPs	\$/pH/ML of waste water of pH < 7.0	55.433	56.476	56.752	56.973
Temperature – all WWTPs	\$/°C/ML of waste water of temperature > 25°C	6.137	6.252	6.283	6.307

ASBG observes that there are no transitional changes in proposed charging scheme. The new charges are to start immediately and only vary afterwards by CPI. This represents a substantial step change from the current charging system to the proposed, with many customers suffering shock price increases in their bills.

The following table lists some of the members reporting price increases associated with the proposed changes to trade waste charges.

**ASBG Member Estimated Impact of Proposed Trade Waste Charges**

<b>Member and Type</b>	<b>Main Impact</b>	<b>Estimated % increase in Water Bills</b>
A: Food – Primary treatment	BOD charges	20.3% (63% in pollutant charges)
B: Food – Tertiary treatment	BOD, SS, N, P charges	43.3% in pollutant and SUC charges
C: Chemical - Primary treatment	BOD	10% increase total bill
D: Food – Primary	BOD	50.5% pollutants, <1% on total bill

These price increases are consistent with the table published in Sydney Water’s submission to IPART. To support ASBG’s position these tables are included below.

**Table 22.23 Impact of proposed pricing path on the top ten Industrial customers discharging to a primary WWTP, including agreement fees and quality charges**

<b>Industrial customers</b>	<b>Current pricing path 2011-12 (annual cost \$)</b>	<b>Proposed pricing path 2012-13 (annual cost \$)</b>	<b>Charge increase (\$)</b>	<b>Increase per year (%)</b>
Paper manufacturer	815,139	374,794	-440,345	-54
Beverage manufacturer	766,433	1,130,933	364,500	48
Paper manufacturer	508,832	900,908	392,076	77
Food manufacturer	174,417	104,799	-69,618	-40
Food manufacturer	166,641	249,846	83,205	50
Chemical manufacturer	153,374	63,541	-89,833	-59
Food manufacturer	140,467	250,919	110,452	79
Food manufacturer	138,713	250,229	111,516	80
Beverage manufacturer	135,323	190,783	55,460	41
Liquid waste processor	135,043	13,336	-121,707	-90
<b>Average</b>	<b>\$313,438</b>	<b>\$353,009</b>	<b>\$39,571</b>	<b>13%</b>

**Table 22.24 Impact of proposed pricing path on the top ten Industrial customers discharging to a secondary/tertiary WWTP, Includes agreement fees and quality charges**

Industrial customers	Current pricing path 2011-12 (annual cost \$)	Proposed pricing path 2012-13 (annual cost \$)	Cost increase (\$)	Increase per year (%)
Beverage manufacturer	323,377	591,473	268,096	83%
Pet food manufacturer	128,933	158,706	29,773	23%
Beverage manufacturer	105,364	207,257	101,893	97%
Beverage manufacturer	100,639	223,762	123,123	122%
Egg products manufacturer	99,871	182,610	82,739	83%
Food manufacturer	88,299	178,650	90,351	102%
Liquid waste processor	82,635	67,921	-14,714	-18%
Food manufacturer	60,123	26,930	-33,193	-55%
Food manufacturer	60,106	37,298	-22,808	-38%
Council depot	54,886	23,070	-31,816	-58%
<b>Average</b>	<b>110,423</b>	<b>169,768</b>	<b>59,344</b>	<b>54%</b>

**Table 22.25 Commercial customers discharging to a primary WWTP**

Commercial process codes	Business count	Current pricing path 2011-12 (average annual charge)	Proposed pricing path 2012-13 (average annual charge)	Increase per year (%)
Automotive	2,725	\$85.18	\$389	356
Commercial laundry	419	\$46.43	\$905	1,850
Equipment hire wash	75	\$725.27	\$749	3
Low strength BOD food	719	\$213.66	\$435	104
Higher strength BOD food	11,451	\$200.62	\$597	198
Lithographic	74	\$10.32	\$155	1,400
Miscellaneous	252	\$0	\$0	n/a
Other	2,193	\$86.52	\$0	-100
Photographic	354	\$145.26	\$0	-100
Ship to shore	34	\$37.70	\$739	1,860
<b>Average</b>				<b>188%</b>

As expected the main impacts in trade waste charges will affect discharges to inland sewage treatment plants. Price increases vary up to 122%. Given these are the top 10 customers their bills are substantial. Commercial customers are also highly affected with Sydney Water’s analysis suggesting price increases of over 1,850%. These are indeed shock price increases.

Members indicated they are annoyed that Sydney Water is proposing such a radical change to their trade waste pricing with little provision of warnings. Customers have little time to consider their options and lack the opportunity to install pretreatment equipment or process modifications. The larger customers this process from new pricing certainty to operational changes/treatment systems can take over 4 years.

If these price increases are to be accepted ASBG at a minimum asks that a ramp up in charging rates be used by Sydney Water in transition to the new pricing structure to avoid price shocks to industrial customers. This is particularly important in the tough economic environment in which the manufacturing sector is currently facing.

***ASBG recommends that IPART require Sydney Water use a transitional pricing structure to introduce the new trade waste charges over a period of 4 years.***

Given the high costs which will impact on some companies a more gradual price increase trajectory is desirable to avoid shock price increases. As all trade waste agreement holders are to also experience a sharp ~9% in water bills in the first year, the additional shock of higher trade waste charges will add considerably to their increase in bills to well over 100% in some cases. Moving the trade waste charges to be introduced more gradually and commencing out of synchronization of the main water price increase is preferred. Additionally, a known trade waste price change trajectory will provide time for production changes and where possible additional treatment systems (not merely for BOD) to be considered.

## **BOD Charges**

Sydney Water provided the example that on average the BOD prices would increase by 71% for primary treatment and 121% for secondary and tertiary treatment systems. While these are average price increase they vary considerably for BOD strengths above domestic strength. Table 2 provides an example of this variation.

BOD mg/l	Current		Proposed		% increase	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
<b>500</b>	0.133	0.680	0.435	1.85	328%	272%
<b>1000</b>	0.147	0.694	0.435	1.85	296%	267%
<b>2000</b>	0.176	0.723	0.435	1.85	247%	256%
<b>5000</b>	0.264	0.811	0.435	1.85	165%	228%
<b>10000</b>	0.410	0.957	0.435	1.85	106%	193%
<b>15000</b>	0.556	1.103	0.435	1.85	78%	168%
<b>20000</b>	0.701	1.248	0.435	1.85	62%	148%

\* Only considers concentrations above domestic strength, not directly comparable to the average 71% primary and 121% increases Sydney Water identified.

Sydney Water in going to a flat BOD charging rate are in effect penalizing those with lower BOD discharges with the highest percentage increase as shown in the above table. While a flat charge is simpler, it may not best reflect the costs of BOD on the sewerage system. This again is another argument for at least a transitional pricing system change over plan. Strength of BOD impact on sewerage system, is not considered flat. A flat rate may reflect the cost of treatment at the sewage



treatment plant (STP) it does not appear to reflect the corrosion costs of the sewer pipes. Continuing to use a linear pricing<sup>2</sup> policy would better reflect Sydney Water's costs, and should result a smoother in transitional bills for most large customers.

Another observation is BOD charges will be the source of the majority of cost increases on industrial customers. Sydney Water indicated to ASBG that the BOD charges are to focus on the soluble BOD fraction. Soluble BOD is also the more costly to remove. Put simply the most cost effective process to remove soluble BOD is to use biological systems. Basically getting bacteria to eat the food in the wastewater (of which BOD is a measure) and remove the bacteria as a solid.

Biological treatment plants are CAPX intensive, requiring large capacity tanks. This in turn requires a plant with a large land footprint. Given the high cost of land in the Sydney Metropolitan area the percentage increases provided by Sydney Water will be uneconomic for the majority of price affected trade waste customers. Additionally, given the high costs of electricity, including the new carbon prices, the use of biological treatment with air injection (aerobic systems using blowers to bubble air through the wastewater) are also less economic. The alternative systems such as trickling filters or anaerobic systems require approximately 4 times the tank volumes of forced aerobic systems. Again this makes the economics poor, unless the company has substantial free land.

It makes better economic sense for Sydney Water to offer its BOD reduction services based on economies of scale. However, the treatment costs appear, under the proposed pricing scheme to be more dominated by protection of pipelines and odour control, rather than the treatment costs at the end of the pipe. Perhaps for some companies consideration of payment for pipeline protection on an individual basis may offer a lower long term cost savings.

The new BOD charges given ASBG's member inquiry, shows this is the major cost increase for most customers. Consequently, the increase in BOD is more important to have a long transition period.

## **Temperature**

Temperature is a new charge rate. Its introduction, according to Sydney Water, is due to its role in sewer corrosion. Currently there is no charge for temperature, but an upper acceptance limit of 38 °C applies.

ASBG is concerned that the tables above on the expected price impacts from Sydney Water's submission do not take temperature properly into consideration in the final percentage charge increase. As temperature is generally not reported, unless it exceeds the 38 degrees limit, ASBG doubts this aspect of charging can be reasonably estimated.

Sydney Water's pricing proposal has temperature charged at the following linear rate:

$$\text{Charge}(\$) = \text{ML of discharge} \times {}^{\circ}\text{C} > 25^{\circ}\text{C} \times 6.137 \text{ (2012-13)}$$

Members are concerned that this cost can be considerable, one member claiming over \$400 per day. The way in which temperature is to be measured remains to be clarified as it can vary considerable over a day. Treatment costs to reduce temperature are energy dependent, and require high CAPX plant. This usually comprises of heat exchangers and cooling towers. Ironically cooling trade waste will consume more potable water to supply evaporative cooling systems. This is also contrary to Sydney Water's policy on water conservation.

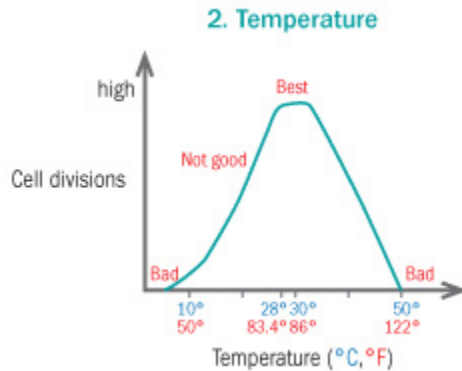
ASBG has a number of issues with the new temperature charging system:

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<sup>2</sup> Linear pricing is where the charge rate \$/kg varies in proportion to concentration.

- It may be a considerable expense for some customers, which has not been properly explored by Sydney Water in its submission.
- It is a linear charge rate, but the impact of temperature is on biological action is exponential.

The reason for including the temperature charge is its impact on biological activity in the sewerage system. Higher biological action is proportional to sewer corrosion, hence the need to better control temperature. The figure below shows typical growth rates of sewage bacteria vs temperature.



**Figure 1 Sewage Treatment Bacterial Growth Rate vs temperature<sup>3</sup>**

Peak temperature for maximising the growth of sewage bacterial is around 32°C. So adding a warmer trade waste water stream in to a sewer line will increase its temperature in proportion to its volume and temperature difference between the waste water and the sewage. As can be seen the growth rate is not linear, but exponential. The growth rate of bacteria is not dependent on the trade waste temperature, but on that of the sewage in the pipe.

Overall there is an argument to consider changing the temperature charge rate from a linear to an exponential charge rate. Sydney Water in the past use to charge BOD using an exponential charge formula, so this not a new approach.

Another issue with temperature is than especially in summer the potable water supply can be above 22°C, providing little room for customers in which to incur a charge rate. ASBG argues that a perhaps the 25°C rate be raised or the exponential charge rate start at a low cost per ML. Ideally, trade waste charges should be set on its impacts on the local sewer. Taking upstream and downstream measurements will reveal the impact an industrial customer has on the quality of total sewage in the pipe. This would be the most accurate means to measure trade waste customer costs on Sydney Water's operations.

The difficulty of this approach is the measurement of upstream sewage, particular flow rates, which can vary considerably, especially during heavy rain periods. Downstream quality can be calculated by knowledge of the flows and concentrations in the customer's stream. It can be difficult to directly measure impact downstream, but may in some circumstances be more cost effective.

Temperature increases are perhaps the more easily measurable of its in pipe impacts. If temperature is a considerable cost for some customers, perhaps an alternative charging system be considered for direct changes that a customer creates in the pipe. ASBG acknowledges this is a considerable change from the current flat charging rate. It is perhaps too late in this determination process to consider this approach, due to many complexities and unknowns. However, it should be considered for the next trade waste review.

<sup>3</sup> <http://www.teamaquafix.com/ammoniaiwastewater.aspx>

## pH Charges

Like temperature, pH currently has no charge but is controlled by acceptance limits. pH itself is a negative log measurement, so attaching this to a linear charge rate does not make much logical sense.

The new charge is expressed as:

$$\text{Charge (pH \$)} = \text{ML of discharge} \times \text{pH} < 7 \times 55.433 \text{ (2012-13)}$$

The treatment costs for correcting pH, in this case raising it are again strongly exponential. A pH difference of 1 is a factor of 10, whereas 2 is a 100 times. Another issue is that pH has current acceptance limits of between 7 to 10. So if the acceptance limits are to be kept, then this charge rate is meaningless.

pH is relatively cheap, with bulk prices for caustic soda varying from \$300/t to \$500/t for 50% solution. On this basis a 1,000 litre IBC of 50% caustic soda would raise pH by 5.1 units per ML. Or to put it another way 40 grams of caustic soda would provide the first pH rise of 1; 400 grams would provide a pH of 2 and so on with the log scale. In monetary terms, using 1 kg caustic costs about \$1, the first pH rise would equate to a price of 4 cents per ML assuming a cost at \$500 for 500 kg. Raising pH by 2 would cost about 40 cents; 3 is \$4 and so on. So Sydney Water's linear price of about \$55 per pH unit becomes non-cost effective at pH increases above about 4.1. pH correction using lime would be even more cost effective.

This assessment shows two findings:

- Sydney Water's pH charges do not reflect costs for pH increases
- On-site costs for pH correction are low and most if not all companies will meet the pH 7 limit.

***ASBG recommends the temperature and pH proposed pricing be reconsidered to reflect their exponential rather than linear relationship to the costs to Sydney Water.***

## Use of pH for Off-Set Credits

One of the problems with managing corrosion for Sydney Water is dealing with the lower pHs which can be present and form in the sewage. Higher pH has a positive impact on controlling the corrosion rate. Therefore it is in Sydney Water's interest to encourage trade waste dischargers to maintain a high pH rather than stick to the minimum permitted pH of 7. An upper pH limit of 10 reflects Sydney Water's implied desire to have higher pH in discharges.

pH correction is one of lower cost treatment mechanisms and using an appropriate charging system the incentive for in-house treatment can be very cost effective. Most trade waste customers have pH adjustment equipment installed. As the CAPX is already in place the main increase in cost to achieve higher pH is largely driven by OPEX – chemical costs, which are discussed above.

Sydney Water's charging rates are far lower than on-site treatment costs for the majority of industrial customers. pH is the exception, being far lower than on-site treatment costs. As a consequence, ASBG considers there is scope to use pH adjustment as an off-set for other trade waste substance charges. Hence, an off-set payment basis would encourage many industrial waste customers to increase their pH to the maximum limit of 10.


Further research may be required to identify the full benefits of such a program, as it may prove to be more cost effective at reducing sewer corrosion than other treatment methods. Perhaps in the future if pH increases proved effective then other charge rates may be revisited and possibly lowered.

ASBG also considers that the linear pH charge rate requires to be revisited and an exponential charge formula appears a better fit. The question is how much will Sydney Water reward industrial customers to increase the pH of sewage? High sewer pHs may have much larger impacts on reduction of sewer corrosion than it costs. However, such assessment is not straight forward and will take some time to identify the advantages of such changes to sewage pH.

***ASBG recommends that a new pricing formula for pH be also used as an off-set payment for customers providing pH above 7 (the lower limit) up to 10, (its upper limit).***

Should you require ASBG to clarify or elaborate on the above matter please contact me.

Yours Sincerely

A handwritten signature in black ink, appearing to read "Andrew Doig". The signature is fluid and cursive, with a large loop at the end.

Andrew Doig  
National Director  
AUSTRALIAN SUSTAINABLE BUSINESS GROUP