Appendix F - Risk Assessment

F1 Environmental Setting

A comprehensive EIS was submitted as part of the requirements of the original ICP development consent. As a result, all environmental impacts were assessed and evaluated in great detail. To avoid repetition of the original EIS here, a general risk analysis of the proposed modifications only has been undertaken to assist in the identification of key environmental issues to be addressed.

F2 Identification of Environmental Aspects and Impacts

Table F-2 identifies environmental aspects and environmental impacts from each proposed modification from the original ICP development consent. Once identified, each environmental impact is ranked from 1-5 which identifies the likelihood (L) of the impact occurring. A consequence ranking (C) is then given for the magnitude the consequence will have on the environment. Added together, the inherent risk is calculated (see **Table F-1** for the risk definitions).

F3 Key Environmental Issues for Assessment

The environmental impacts which are identified as having a "high" (>6) inherent risk are considered to be key issues. Those impacts which have a risk ranking of 5 are considered to have a moderate inherent risk and those that have a ranking from 1-4 are considered to have a low inherent risk. The impacts which are deemed to be beneficial are identified with a "B".

Table F-1 Risk Definitions

Likelihood (L)		
1	Rare	Event may occur but only under exceptional circumstances.
2	Unlikely	Event could occur at some time.
3	Possible	Event should occur at some time.
4	Likely	Event will probably occur in most circumstances.
5	Almost certain	Event expected to occur in most circumstances.
Consequence (C)		
1	Negligible	No detectable effect on or off site.
2	Minor	Detectable effects with minimal impact on site.
3	Moderate	Effects on and off site requiring attention.
4	Major	Sizable effects warranting immediate attention.
5	Critical	Sizable effects with a large impact warranting immediate attention.
Risk Level (L+C)		
2-4	Low	
5	Moderate	
6+	High (Key issues)	
B	Benefits resulting from the proposed modifications are identified with a "B" and will be addressed further.	

Table F-2 Identification of Environmental Aspects and Impacts Associated with Proposed Modifications

Environmental Issue	Environmental Aspect	Environmental Impact	L (1-5)	C (1-5)	R (L-H)	Comment
Air Quality	Change in boiler configuration	Change in number and size of new boilers as well as the indigenous fuel supply would result in the generation of different air emissions.	4	3	7	This is considered a **key** environmental issue.
Greenhouse Gas Emissions	Proposed changes to ICP project	Change in greenhouse gas emissions.			B	This project is expected to result in an overall reduction in greenhouse gas emissions in New South Wales due to reductions in coal-fired power generation elsewhere.
Noise	Operation of new salt water cooling system	Noise generated during the operation of the new salt water cooling system.	2	2	4	There is not expected to be any additional noise generated with the new salt water cooling system. The discharge piping would be underground reducing the potential for noise. In addition, there would no longer be noise generated by the operation of the cooling tower. Therefore this issue is considered to be a **low** environmental issue.
Water Quality	Piping and gantry over Allan's Creek	Potential during construction for spills to impact Allan's Creek.	2	2	4	With the implementation of an Environment Management Plan (EMP), this is considered to be a **low** environmental issue.
	Piping and gantry over Allan's Creek	Potential during construction for contaminated soil to impact Allan's Creek.	2	2	4	With the implementation of an EMP, this is considered a **low** environmental issue.

Environmental Issue	Environmental Aspect	Environmental Impact	L (1-5)	C (1-5)	R (L-H)	Comment
	Anti-fouling agent used for salt water cooling	Impacts on water quality resulting from need to undertake intermittent dosing to stop macro-fouling.	3	3	6	This is considered a **key** environmental issue
Water Resource	Salt water cooling system	Need for TTE from Wollongong STP would no longer be required. Approx. 10ML/day of fresh or recylced water would no longer be required.			B	This is a benefit and considered a positive environmental impact.
Human Health	Relocation of gas holder	The gas holder has been moved to a more isolated location within PKSW.			B	This is a safety benefit and considered a positive environmental impact.
	Change from cooling tower to salt water cooling.	There would no longer be the need to store chemicals necessary for a cooling tower.			B	This is a beneficial impact as a result of the proposed modification and considered a **moderate** environmental issue.
Terrestrial Flora and Fauna	Additional piping and gantry	Piping laid underground connecting the ICP to the gas holder as well as additional piping associated with the salt water cooling discharge has the potential to disturb terrestrial flora and fauna.	2	1	3	PKSW is a highly modified industrial area and has little terrestrial flora and fauna. This is considered to be a **low** environmental impact.
	Transmission lines associated with the proposed relocation of the HV substation	Underground transmission lines may disturb terrestrial flora and fauna	4	2	6	This is considered a **key** environmental issue.
Aquatic Flora and Fauna	Salt water cooling discharge	Discharge of cooling water into Allan's Creek and Port Kembla Harbour	3	3	6	This is considered a **key** environmental issue.
Hazard and Risk Assessment (Land Use Safety)	Gas holder relocation	The gas holder would be closer to the boundary of PKSW and therefore closer to local residential areas resulting in potential land use safety issues.	3	3	6	This is considered a **key** environmental issue.

Environmental Issue	Environmental Aspect	Environmental Impact	L (1-5)	C (1-5)	R (L-H)	Comment
	HV substation – electrical transformer	Transformer explosion.	1	3	4	This is considered a **low** environmental issue.
Indigenous and Non-Indigenous Heritage	Gas holder relocation	The site may contain items of non-indigenous heritage.	1	2	3	The NSW Heritage Register, National Parks and Wildlife Services Aboriginal Sites Register, Illawarra REP and Wollongong LEP do not record any items of heritage significance within PKSW. This is considered to be a **low** environmental issue.
Visual Amenity	Re-sizing and re-location of gas holder	Due to the increase in the size of the gas holder and its relocation, this may impact upon the visual amenity of the local residences.	5	3	8	This is considered to be a **key** environmental issue.
	Consolidation of ICP site	Consolidation of ICP footprint impacting upon the visual amenity of local residents.	1	1	2	The consolidation of the ICP site is within the boundary of the PKSW and will not result in a loss of visual amenity. This is considered to be a **low** environmental issue.
	Relocation of HV substation	Internal re-location of HV substation impacting upon visual amenity of local residents.	1	1	2	The new location of the HV substation is within the boundary of the PKSW and will not result in a loss of visual amenity to local residents. This is considered to be a **low** environmental issue.

Environmental Issue	Environmental Aspect	Environmental Impact	L (1-5)	C (1-5)	R (L-H)	Comment
	Cooling tower (no longer required)	Visual impact associated with a vapour plume from the cooling tower.			B	Vapour plumes from the cooling tower may have been visible under certain conditions but will now no longer be an issue.
Socio-Economic Impacts	Temporary and permanent workforce associated with the project	Construction and operation phase of this project will require an additional temporary and permanent workforce as outlined in the original development application.			B	This is a beneficial socio-economic impact.
Traffic and Transportation	New gas holder location	Construction traffic will be redirected to the new gas holder location	3	1	4	As the traffic will be redirected within PKSW this is considered a **low** environmental impact.
Soil/Land Contamination	Construction phase of gas holder, HV substation and boilers at new locations as well as piping associated with the proposed modifications.	Possible disturbance of contaminated soil during the construction phase	3	2	5	During the construction phase, appropriate mitigative measures would be used to construct the gas holder, HV substation and boilers. Mitigation measures for the possible disturbance of contaminated soil are outlined in the original EIS. This is considered to be a **moderate** environmental issue.

Environmental Issue	Environmental Aspect	Environmental Impact	L (1-5)	C (1-5)	R (L-H)	Comment
Waste Water	Liquid waste water generated from operation of the ICP Project	Where re-use is not possible, liquid waste water generated may be discharged into Allan's Creek	3	1	4	During operation of the ICP Project waste water will be generated. Where appropriate, the waste water will be re-used. Where it cannot be re-used, it may be discharged into Allan's Creek where is it not expected to have an impact on the aquatic ecology. This is considered to be a **low** environmental issue.
Climate Change	Increase in sea levels in Port Kembla Harbour and Allan's Creek	Rising sea levels has the potential to impact upon the effective operation of the ICP cooling system's discharge device	2	2	4	If sea levels rise impacts on the effective operation of the ICP cooling system discharge device, it would be modified accordingly. This issue is considered to be a **low** environmental issue.
	Increase in temperature in Port Kembla Harbour and Allan's Creek	Increase in temperature may impact upon the aquatic ecology of Allan's Creek and Port Kembla Harbour and may potentially impact upon the effectiveness of the cooling system.	2	2	4	Port Kembla Harbour is a highly disturbed harbour with existing elevated water temperatures. It is considered likely that over the life of the ICP Project (approximately 50 yrs) and based on the potential temperature change in the Harbour due to climate change, the aquatic ecology would not be significantly impacted. If the ICP cooling system becomes less effective, options would be

Environmental Issue	Environmental Aspect	Environmental Impact	L (1-5)	C (1-5)	R (L-H)	Comment
						considered to modify the cooling system. This issue is considered to be a **low** environmental issue.
	Change in meteorological conditions in the Illawarra region	A change in the meteorological conditions in the Illawarra region may impact upon any air dispersion modelling undertaken.	1	1	2	Changes in temperature or wind patterns as a result of climate change is expected to have a very minor impact on modelling results as the set up of any air dispersion model takes into consideration a range of meteorological conditions. This issue is considered to be a **low** environmental issue.