Powerco CPP – Portfolio Overview Document

Portfolio Name	Whenuakite Zone Substation
Expenditure Class	Capex
Expenditure Category	Growth & Security
As at Date	12 June 2017

Expenditure Forecast[1,2]	Pre CPP	FY19	FY20	FY21	FY22	FY23	Post CPP	CPP Period Total	Project Total
Pre-Internal Cost Capitalisation and Efficiency Adjustments[3] *(2016 Constant NZ$(M))*	$0.2	$0.2	$0.2	$0.2	$1.4	$4.8	$0.0	$6.9	$7.1
Post-Internal Cost Capitalisation and Efficiency Adjustments *(2016 Constant NZ$(M))*	$0.3	$0.2	$0.2	$0.2	$1.5	$4.8	$0.0	$7.0	$7.2

Description	
Project need overview	Powerco's Coromandel subtransmission network, specifically around Whitianga (and the surrounding holiday areas), does not meet the desired security of supply standards due to capacity constraints of the existing circuits and the existing 11kV distribution network has limited backfeeding capability.

[1] Forecast expenditure is based on Powerco's financial year (i.e. FY18 is for the period April 2017 through March 2018). Expenditures do not consider general price level changes over time (i.e. are in real or constant terms).
[2] Only includes Growth & Security Expenditure. Some projects discuss and rely on the replacement of assets that are at "end of life". However, the replacement cost for these assets is accounted for in the Replacement Expenditure category.
[3] All other forecast expenditure / cost estimates in this POD are pre-internal cost capitalisation and efficiency adjustments, consistent with this forecast.

Proposed solution	
Project solution overview	Powerco is proposing to construct a new 66/11kV zone substation at Whenuakite in the Coromandel Area. The substation will be supplied via a ≈5km deviation of the existing Tairua-Whitianga 66kV overhead line. The new substation is required to cope with the growth in electrical demand that has occurred and is projected to continue at a number of popular holiday destinations to the south of Whitianga (i.e. Cooks Beach, Hahei and Hot Water Beach). The new substation will also significantly improve regional network security and reliability.

Need Identification	
Background	Powerco's Coromandel Area encompasses the Coromandel Peninsula[4] and north-eastern section of the Hauraki Plains. The sub-transmission network consists of a 66kV network of mostly overhead lines[5] that supply six zone substations (Kerepehi, Matatoki, Thames, Coromandel, Whitianga and Tairua) (refer to Figure 1 & Figure 3). The sub-transmission network is supplied from the Transpower owned Kopu 110/66kV GXP (located to the south of the Thames township). The area is characterised by rugged, bush-covered terrain, making line access difficult and seasonal weather extremes and cyclones impact heavily on network security. Whitianga and the surrounding localities (the area of focus for this project) are characteristic of resort towns in the Coromandel area, with a seasonal demand peaking in the summer. Also, Whitianga, being the second largest town in the Coromandel area with a population of 3,800[6], has sufficient infrastructure to support an increasing permanent population.
Underlying Drivers and Investment Triggers	The Whitianga Area has a number of constraints that are relevant to the Whenuakite project as follows: 1. The coastal townships to the south of Whitianga (including Hahei and Hot Water Beach) are supplied by two 11kV feeders as follows: • **Coroglen Feeder**: a rural overhead line feeder that follows a path south from the Whitianga substation to Coroglen and then heads east to Whenuakite and Hot Water Beach, a distance of approximately 25km. The 2015 peak network load was approximately 2.9MVA. A significant portion of the electrical load is at the end of this feeder. It is equipped with a voltage regulator and two pole mounted capacitor banks to provide voltage support. • **Purangi Feeder**: passes through the Whitianga township (via cable & overhead line), crosses the Whitianga harbor (via submarine cable) to supply the Cooks Beach area before heading south-east (via overhead line) to Hahei. The 2015 peak load on the feeder was approximately 3.6MVA.

[4] A rugged, forested, coastal peninsula, with five towns that have a population >1,000. The economy is mostly based on tourism with little heavy industry.
[5] There is a small section of underground 66kV cable between the Kopu GXP and the Thames substation.
[6] Statistics New Zealand, http://www.stats.govt.nz/Census/2013-census, retrieved, 13 August, 2015

	If the Whitianga harbor 11kV submarine cable experiences a fault it would take a long period of time to repair and would result in a significant consumer outage during peak summer loading periods. The adjacent Coroglen feeder would need to supply the 3.6 MVA peak load via long, voltage constrained, feeder sections. At present its backfeed capability is limited to 2 MVA. 2. During 2014 the peak loading level on the Whitianga 66/11kV substation was 16.2MVA which exceeds the existing (N-1) substation capacity[7]. The 11kV back-feed from the adjacent 66/11kV substations is small and the Whitianga substation does not meet the requirements of Powerco's Security-of-Supply Standard, which recommends that the substation should be afforded a (N-1), no break supply network with a security class of AA[8] . 3. Over the period 2007 through 2013 the Whitianga substation experienced ≈3% growth per annum. This growth is generally supported by the published census information of the township's population growth. In the future Whitianga is forecast to experience peak demand increasing at 1.6% per annum. At present, a number of the 11kV feeders at the substation have an ICP count well in excess of the maximum for their respective security levels. Whitianga feeders 1 and 5 exceed their maximum number of ICPs for their F3 /F4 security rating. Whitianga feeders 2, 3 6 and 7 exceed their maximum number of ICPs for their F3 security rating. The rapid growth in Whitianga requires a combination of more feeders and zone substation capacity.
Timing of the need	The proposed new 66/11kV substation is currently required (as of 2016) and thus Powerco has begun investigating the potential line routes and substation sites[9]. However, discussions with the relevant land owners over which the 66kV line is proposed have yet to begin and consents have yet to be granted by the relevant council. As a result of this, Powerco expect to initiate access and consents in FY2018 with a view of starting construction in FY2022.

[7] 12/17MVA transformer nameplate rating with a continuous rating of 15MVA during summer conditions (Powerco Standard 393S041 - ZONE SUBSTATION TRANSFORMER RATINGS).
[8] AA - Supply may be lost in the event of the outage of one major element of the sub-transmission network. Supply can be resorted within 45 minutes by switching at sub-transmission or distribution level (Powerco - Standard 310S001 – Security of Supply Classification – Zone Substations).
[9] Some geotechnical tests have already been undertaken with the objective of establishing a suitable substation site.

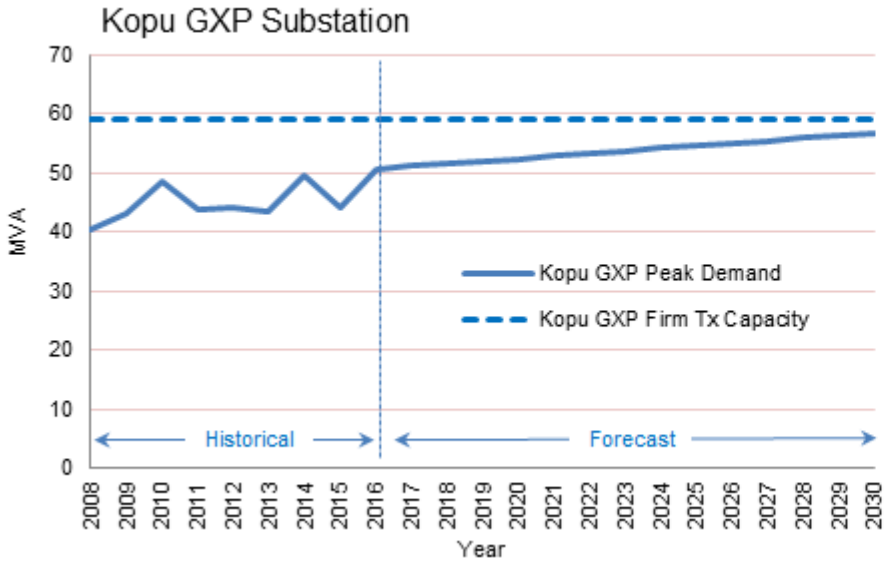
Demand Forecast | Coromandel Area

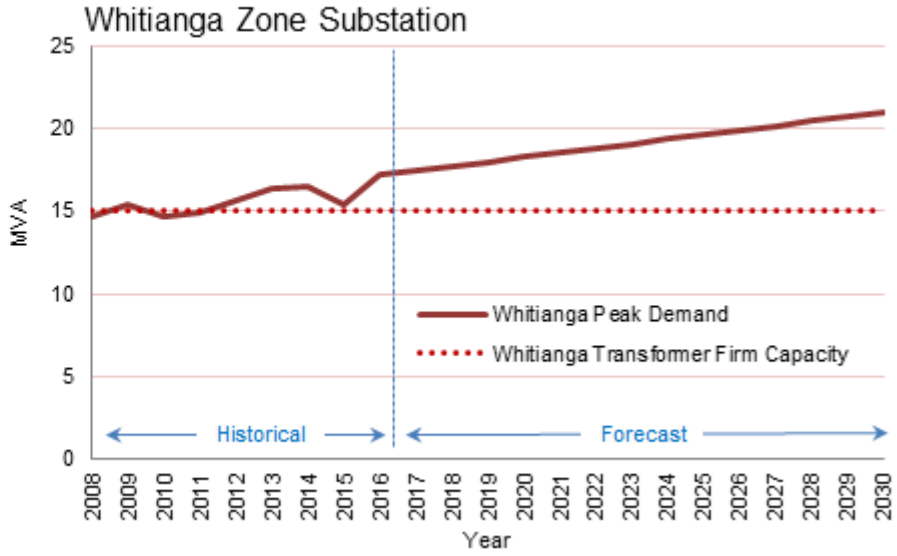
COROMANDEL AREA SUBSTATIONS			FORECAST MAXIMUM DEMAND [MVA]						
SUBSTATION	CLASS CAPACITY	GROWTH	2016	2017	2018	2019	2020	2025	2030
Coromandel	0.0	0.9%	4.7	4.8	4.8	4.8	4.9	5.1	5.3
Kerepehi	0.0	0.7%	10.1	10.2	10.3	10.3	10.4	10.8	11.1
Matatoki	0.0	0.9%	5.6	5.7	5.7	5.8	5.8	6.1	6.3
Tairua	7.5	0.7%	8.6	8.7	8.7	8.8	8.8	9.1	9.4
Thames T1 & T2	0.0	0.3%	13.4	13.5	13.5	13.5	13.6	13.8	13.9
Thames T3	6.9	0.0%	3.4	3.4	3.4	3.4	3.4	3.4	3.4
Whitianga	0.0	1.6%	17.2	17.4	17.7	18.0	18.3	19.6	21.0

COROMANDEL AREA SUBSTATIONS			FORECAST MAXIMUM DEMAND [MVA]						
GXP	TX CAPACITY	GROWTH	2016	2017	2018	2019	2020	2025	2030
Kopu GXP	60.0	0.9%	50.6	51.1	51.5	52.0	52.4	54.6	56.8

Notes:

1. Class capacity is similar to Firm Capacity in that it represents the capacity that can be delivered following the first outage of any major equipment. Unlike Firm Capacity it considers the long term deliverable capacity after allowing for switching and network reconfiguration (11kV & 33kV) post-fault conditions.
2. All maximum demand values are in MVA.
3. Purple shaded cells indicate that the substation's Class Capacity has been exceeded and network enhancements should be considered.





Options Analysis | Long List of Project Options | High Level Assessment	
Assessment Process	A wide range of potential options are available for the resolution of electrical network constraints. However, depending on local conditions many of the options may not be suitable. On this basis a two tier Options Analysis is followed. In the first instance all potential options are considered against a set of high level criteria. Those options that are identified as having significant challenges and not favourable are not considered further. A significant issue that Powerco often faces is securing landowner easements and or public support for projects that the local community or landowners are opposed to. For this reason the costs associated with easements/consents are often difficult to estimate and the consenting/land-acquisition stage of a project can take a significant period. Given this fact, Powerco assesses the risk / likelihood of securing development rights for individual projects (within a realistic timeframe) during the high level assessment stage.
Long List of Options	The following table contains a list of the high level project options that are potentially available to resolve the specific network constraints that have been identified within the Whitianga region. The four non-network options (Nos. 2, 3, 4 & 5) are not shortlisted on the following basis: • Fossil fuelled generation (i.e. diesel generation) is technically viable but not shortlisted due to the cost and environmental/consenting challenges. During network contingencies on the Whitianga harbour cable there would be shortfall of ≈3.6MW[10] that would need to be "made up" using stand-by generation. The capital cost of a 3.6MW[10] standby diesel generation plant is estimated to range from $5.4M to $7.2M[11,12]. Additional diesel generators would need to be installed as the demand for electricity increases. • Powerco has not identified any viable renewable generation options that would provide the required security of supply[13]. • Fuel switching and demand side response (DSR) are considered to be deferment strategies. Their viability is not considered to be certain given the growth rates that the Whitianga region has experienced and the fact that the network security levels are already exceeded. The volume of small consumers (and lack of large consumers) further complicates the possibilities associated with fuel switching and DSR. • Powerco currently uses a mains-borne ripple control system to manage significant amounts of hot water cylinder load on its network. During peak loading periods most hot water cylinders are turned off. The demand reduction however is not sufficient to resolve the major network constraint. • Energy storage solutions could be technically feasible, but are not economically viable at the size required to provide viable back-up for

[10] This is the present shortfall and this amount is predicted to increase in the future.
[11] Excludes the ongoing maintenance and operational costs.
[12] Diesel generation plant is estimated to range from $1,500/kW to $2,000/kW, depending on whether it is high, medium or low speed plant.
[13] Typical plant might involve wind turbines or photovoltaic arrays. Both of these generators have an intermittent output which cannot be relied upon unless there was significant penetration and diversity.

	extended periods. For example, an emerging technology that could be employed is storage batteries installed in domestic premises. However, the capital costs associated with 3.6MW[10] of domestic batteries with two hours capacity are estimated to be >$12M[14]. Alternatively, a grid-scale battery solution providing 9MW for two hours would, at current rates, cost >$25M. Many outages could be addressed within two hours and peak demand periods are also usually less than two hours duration. Storage solutions at this size however, would not provide sufficient back-up for extended outages lasting for several hours. Four network reinforcement options were identified (Nos. 6, 7a, 7b & 7c) as potential solutions to the network constraints and issues. Option 6 involves the construction of additional 11kV feeders. Options 7a, 7b & 7c are effectively sub-options involving the installation of a new 66/11kV substation at Whenuakite, but in each case the new substation is connected into the existing network using different configurations. All four network reinforcements were shortlisted.

[14] The installed costs of domestic battery storage systems are currently around $10k - $12k for a 7kWh unit.

Analysis Needs / Drivers:	*List main drivers for analysis here*

Long List of Options | High Level Assessment

Whenuakite Substation Project		*Long list of projects and high level assessment*	*Assessment Criteria*						
PROJECT FOCUS	**No.**	**PROJECT**	Safety	Fit	Feasible Practical		GEIP	Security	Cost	**Short-list**
Do Nothing	1	Allow the electrical demand & risk of consumer non-supply to inc	✓	✗	✗	✗	✗	✗	✓	✗
Non-network	2	Distributed Generation (DG) including peak lopping generation	✓	✗	✓	✓	✓	✓	✗	✗
	3	Fuel switching to reduce electrical demand	✓	✓	✗	✗	✓	✓	✗	✗
	4	Demand Side Response (DSR)	✓	✓	✗	✗	✓	✓	✗	✗
	5	Energy storage	✓	✓	✓	✓	✗	✓	✗	✗
Network Reinforcement	6	Upgrade Whitianga substation & construct 2x11kV feeders	✓	✓	✓	✓	✓	✓	✗	✓
	7a	Whenuakite substation - In & out connection	✓	✓	✓	✓	✓	✓	✓	✓
	7b	Whenuakite substation - Tee connection	✓	✓	✓	✓	✓	✓	✓	✓
	7c	Whenuakite substation - 66kV switching station connection	✓	✓	✓	✓	✓	✓	✗	✓

Key:

Safety	Health and Safety: Any significant implications in terms of Safety or Health - new products or compounds or practices, or requires difficult live line access etc.
Fit	Fit for Purpose: Does the option address the need appropriately and does it fit with other developments in the vicinity.
Feasible	Technically Feasible: Consider the complexity, future adaptability, and whether it aligns with company standards, strategies and policies.
Practicality	Practical to Implement: Are there potential environmental or property issues which may be insurmountable. Can it be achieved in the required time frame.
GEIP	Good Electricity Industry Practice (GEIP): Good practice (technically and environmentally) and in terms of AM practice (capacity, age, technological, safety)
Security	Security and Reliability: Does the option provide adequate levels of security and appropriate reliability considering the demand, load type and future growth.
Cost	Some options will intuitively be known to be far more expensive than other options, and this may preclude them.

Options Analysis | Short List of Options

Option	Capital Cost[15]	Description
Option 6 ***(Upgrade the Whitianga substation and install additional 2x11kV feeders)***	$10.5M	This option involves the following network enhancements: • The upgrade of the existing 2 x 66/11kV transformers[7] at the Whitianga substation to 2 x 16/24MVA. • The construction of 2 x 11kV feeders running south-east of the Whitianga substation to increase network security, improve network reliability and cope with increasing load in the Hahei & Hotwater Beach areas. One 11kV feeders would need to be installed via underground cable through the Whitianga township, and across the Whitianga harbour (via submarine cable) and through Cooks Beach to connect with the existing 11kV overhead network (Purangi feeder) to the south-east of the Whitianga township. The other new 11kV feeder cable will run south to split the Coroglen feeder in two. The feeder cables to be installed are each estimated to be ≈10km in length.
Option 7a ***(Whenuakite Substation - In & Out)***	$7.1M	This option involves a new 66/11kV substation at Whenuakite as illustrated in Figure 2 and Figure 4 and includes the following components: • The consenting and construction of a new single bank, 7.5MVA[16], 66/11kV substation. The land for this substation would need to be purchased, consented and designated. • The above mentioned substation would have 4 x 11kV feeder breakers that would connect/integrate into the existing 11kV network via underground 11kV cables that are installed from the new substation to terminate on the relevant overhead 11kV lines. Additional 11kV switchgear (ABS) would need to be installed to isolate the existing 11kV lines. • The construction of a new ≈5km, double circuit, 66kV sub-transmission line diversion from the existing Tairua-Whitianga 66kV line to supply the new substation. The consents, easements and compensation for the ≈5km line route would need to be negotiated.
Option 7b ***(Whenuakite Substation – Hard Tee)***	$6.9M	Like option 7a this option involves a new 66/11kV substation at Whenuakite but is supplied via a single 66kV line that is tee'd off the existing Tairua-Whitianga 66kV line. The project includes the following major components: • The consenting and construction of a new single bank, 7.5MVA[16], 66/11kV substation. The land for this substation would need to be purchased, consented and designated. • The above mentioned substation would have 4 x 11kV feeder breakers that would connect/integrate into the existing 11kV network via short runs of underground 11kV cables that are installed from the new substation to terminate on the relevant overhead 11kV lines. Additional 11kV switchgear (ABS) would need to be installed to isolate the existing 11kV lines. • The construction of a new ≈5km, single circuit 66kV sub-transmission line that is directly connected to the existing Tairua-Whitianga 66kV line (hard tee) to supply the new substation. The consents, easements and compensation for the ≈5km line route would need to be

[15] The total capital cost of each project. The costs do not consider the time value of money and do not include the economic value of other factors (i.e. network losses and consumer outage costs).
[16] Powerco presently has a spare 7.5MVA, 66/11kV transformer bank (ex-Thames) that could be installed at Whenuakite. However, its availability is not certain at this early stage.

		negotiated.
Option 7c ***(Whenuakite Substation – 66kV Switching Station)***	$9.6M	Like option 7a this option involves a new 66/11kV substation at Whenuakite but is supplied via a single 66kV line that is connected to a new 66kV switching station that is installed in the existing Tairua-Whitianga 66kV line. The project includes the following major components: • The consenting and construction of a new single bank, 7.5MVA[16], 66/11kV substation. The land for this substation would need to be purchased, consented and designated. • The above mentioned substation would have 4 x 11kV feeder breakers that would connect/integrate into the existing 11kV network via underground 11kV cables that are installed from the new substation to terminate on the relevant overhead 11kV lines. Additional 11kV switchgear (ABS) would need to be installed to isolate the existing 11kV lines. • The consenting and construction of a 3 x 66kV breaker switching station in the existing Tairua-Whitianga 66kV line. The site would be on private land which would need to be purchased and designated. • The construction of a new ≈5km, single circuit 66kV sub-transmission line, that connects to the above mentioned 66kV switching station, to supply the new substation. The consents, easements and compensation for the ≈5km line route would need to be negotiated.

Option Analysis | Advantages vs Disadvantages

The following sections summarise the advantages/disadvantages associated with the short listed options. The intention being to also capture project risks and inter-dependencies.

Option	Advantages	Disadvantages
Option 6 ***(Upgrade the Whitianga substation and install additional 2x11kV feeders)***	• Moderate improvement in network reliability through splitting up of existing long feeders. • Ability to stage the project (if economic) by initially installing only one 11kV feeder with the second 11kV feeder being installed as demand increases.	• Submarine cables crossing the Whitianga harbour, which presents RMA risks. • Steadily increasing reliance on the Whitianga substation with limited diversity afforded by adjacent zone substations. • 11kV feeders have to traverse over sections of private land (east of Whitianga harbour) which does present easement/consenting risks.
Option 7a ***(Whenuakite Substation - In & Out)***	• Increased diversity of sub-transmission supply due to the existence of two 66/11kV substations supplying the Whitianga area. • Significant reduction in 11kV feeder lengths which improves network reliability/redundancy. • Increased 11kV back-feed capacity into the Tairua substation, which like the Whitianga substation is very limited. • Delivers (N-1) 66kV line security into the Whenuakite 66/11kV substation. • Reduces 11kV line/cable losses.	• Land/easement/consenting risks associated with installing a ≈5km, 66kV double circuit line across private land. The costs to secure the right to install the substation and line are thus somewhat uncertain.
Option 7b ***(Whenuakite Substation – Hard Tee)***	• The substation related advantages are similar to Option 7a except the overall project costs would be lower due to the installation of a single circuit 66kV supply line.	• Similar land/easement/consenting risks to Option 7a, but the risk is marginally lower due to the installation of a single circuit 66kV line (smaller land footprint). • A new 66kV circuit with a hard tee connection off the existing Tairua-Whitianga 66kV line would create a three terminal line (Tairua, Whenuakite & Whitianga). The protection systems associated with a three terminal line are difficult to manage unless they are comms-assisted. • Only delivers (N) 66kV line security into the Whenuakite 66/11kV substation. • Due to the hard tee connection network reliability improvements would be lower than both Option 7a and Option 7c.

Option 7c ***(Whenuakite Substation – 66kV Switching Station)***	• The substation related advantages are similar to Option 7a.	• Similar land/easement/consenting risks to Option 7a, but the risks are marginally higher due to the need to secure land to install a 66kV switching station at the intersection location where the new 66kV line connects to the existing Tairua-Whitianga 66kV line. • Network reliability improvements would be lower than Option 7a but higher than Option 7b. • Project costs excepted to higher than both Option 7a & Option 7b due to the need to install a 66kV switching station (and acquire the land).

Preferred Option	
Preferred Option	**Option 7a - Whenuakite Substation - In & Out**
Reasons for choosing Option	Option 7a is preferred for the following reasons: • The network reliability improvements would be significant with the result that consumers are subjected to significantly less outages. It also improves the reliability at neighbouring Tairua substation. • A 66kV in & out configuration will not significantly impact the reliability of the existing Tairua-Whitianga 66kV line and provide a secure supply to the new Whenuakite substation. • The chosen option will cater for demand growth past the 20 year study period. It will also significantly reduce the length of the long 11kV feeders that supply consumers to the south and east of Whitianga, with a corresponding reduction in electrical losses & voltage constraints. • It provides the greatest net benefit among the options. • It delivers zone substation diversity to the region.

Option 7a| Detailed Costs[17]

Item	Description	Actual Cost	Projected Cost
A	Property & Consent Costs		
A.1	Substation property designation	-	$107,000
A.2	Substation land purchase	-	$553,000
A.3	Line route designation process	-	$582,000
A.4	Line easement compensation	-	$609,519
B	Investigation and Reporting Costs		
B.1	Evaluating line route options and land access	$68,000	
B.2	Line route establishment & negotiations (preliminary design, mapping, etc.)	-	$414,724
C	Substation Costs		
C.1	Whenuakite 66/11kV substation design & construction	-	$3,453,553
D	Line and Cable Costs		
D.1	66kV double circuit (in-out) final line design & construction	-	$1,327,496
E	Committed/Historical Costs (A+B+C+D)	$68,000	
F	Future Projected Costs (A+B+C+D)		$7,047,292
G	Anticipated Final Cost (E+F)		**$7,115,292**

[17] Excludes Powerco's internal/overhead costs.

Option 7a | Implementation Plan Project or Action	Start Year[1]	End Year[1]	NZ $'000[1]	Details / Comments
Project costs to date	-	FY14	$68	Costs that have already occurred.
Line route investigations and establishment	FY18	FY18	$174	Investigative work to establish a credible route, including preliminary line designs, route surveys, land owner discussions and property advice.
Future substation land-purchase/consents	FY19	FY21	$660	The designation and purchase of a suitable substation site.
Future line land/easements/ compensation/consents	FY22	FY22	$1,432	The easements, compensation and designations etc. in order to secure a line route.
66/11kV, 7.5MVA Substation	FY23	FY23	$3,454	The design, procurement, construction and project management associated with a 66/11kV substation. Including costs to integrate the substation into the existing 11kV network.
Double circuit 66kV overhead line	FY23	FY23	$1,327	A ≈5km, double circuit, 66kV line that diverts the existing Tairua-Whitianga 66kV line to the Whenuakite substation site.
Total Project Costs ➔	-	**FY23**	**$7,115**	Includes Only Growth & Security Expenditure.

Supporting Documents and Models	
Planning documents ***Standards | Policies*** ***Reviews and Consultant reports*** ***Concept Designs | Estimates***	1. Whenuakite Substation Project Options Analysis_Final. 2. Draft *BOARD SUBMISSION AND APPROVAL PAPER BOARD MEMORANDUM NUMBER 863*, dated 6th December 2011. 3. Whenuakite 66/11kV Substation and 66kV Line Diversion, CCE, VH00012-RPT-EEE-017, dated May 2015. 4. Whenuakite Options-Economic Evaluation_Final. 5. Whenuakite Project Costs 26-10-2016 6. Powerco's 2013 and 2016 Asset Management Plan (AMP). 7. Powerco Network Development Plan, 2017 8. Transpower's Annual Planning Report (APR). 9. "*310S001 Security-of-Supply Classifications – Zone Substations*", Powerco Standard. 10. "*393S041 Zone Substation Transformer Ratings*", Powerco Standard. 11. "*393S035 Electrical network Conductor Rating Standard*", Powerco Standard.

Notes/Assumptions	
Generic Assumptions in relation to Options Costs	• Costs are expressed in 2016 (real) dollars. • The capital costs fall within the Growth and Security expenditure categories only. • The capital costs only include Powerco's capital expenditure (not Transpower or other parties). • The costs include all costs associated with the proposed projects (or alternate options) regardless of whether those costs fall within the CPP period or not, although they do not include any sunk costs (committed already). • Reliability costs are the NPV of the Value of Loss Load calculation for each option
Specific Assumptions in Relation to Options Costs	• Cost estimation for the options has initially been achieved via a desktop study using Powerco's standard building block unit costs. They costs have then been refined by further investigations. • Property and consenting costs are usually a high risk area involving considerable uncertainty. Proposed underground cable is installed where possible in road reserve.

Figure 1: Existing Kopu GXP Sub-transmission Network: Geographic Diagram

Figure 2: Option 7a: New Whenuakite Substation : Geographic Diagram

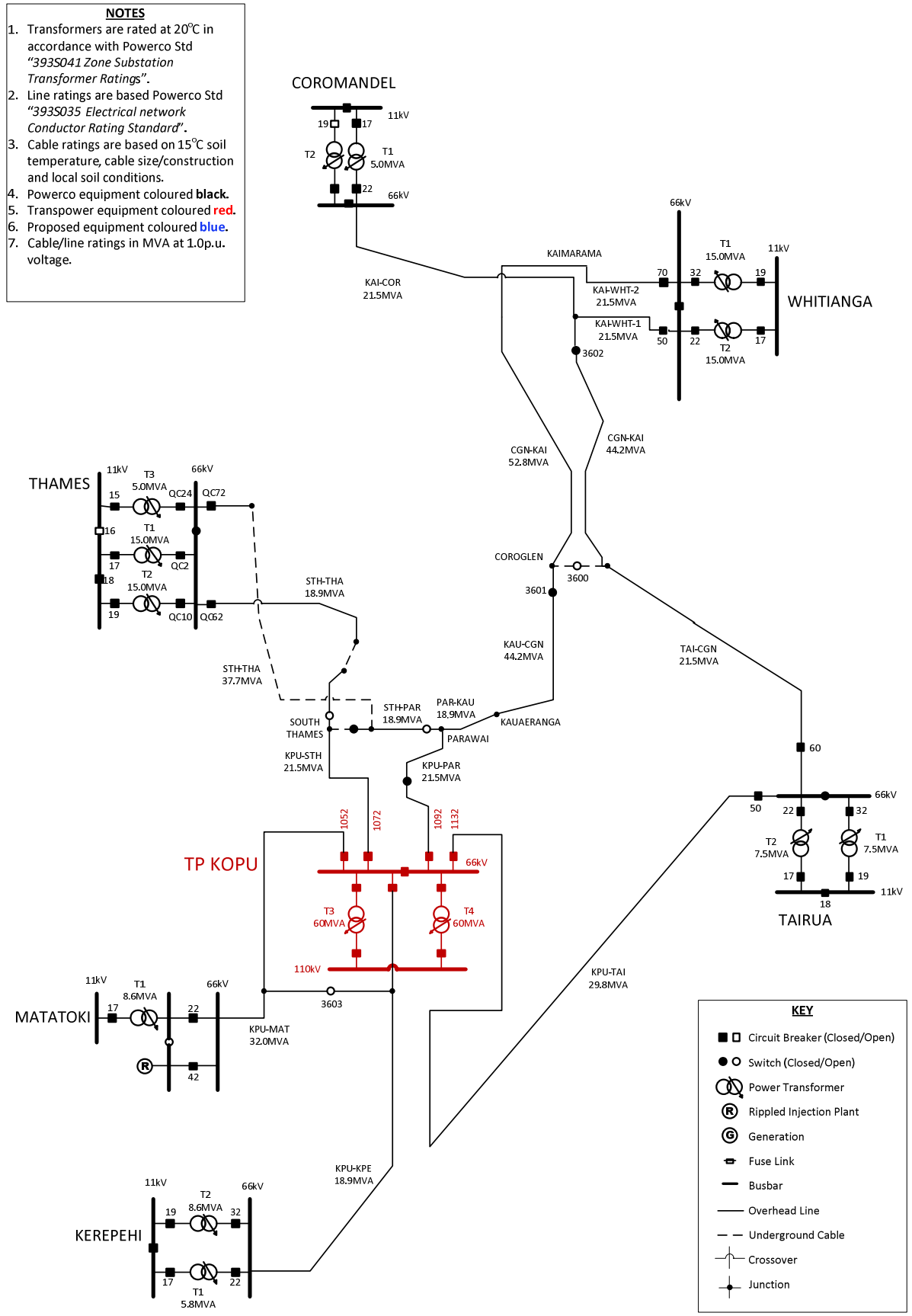


Figure 3 Existing Kopu GXP Sub-transmission Network : Single Line Diagram

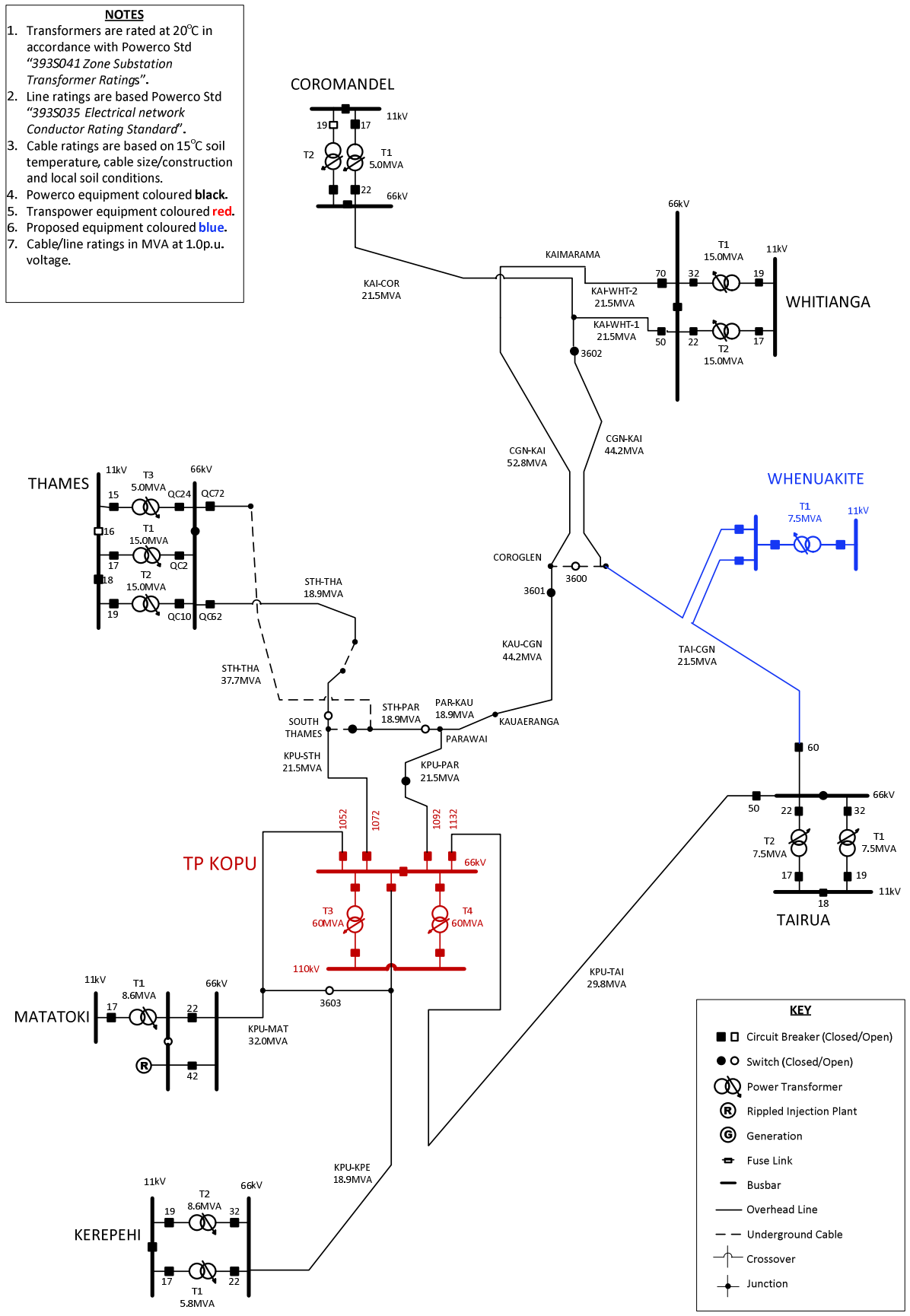


Figure 4 Option 7a: New Whenuakite Substation : Single Line Diagram