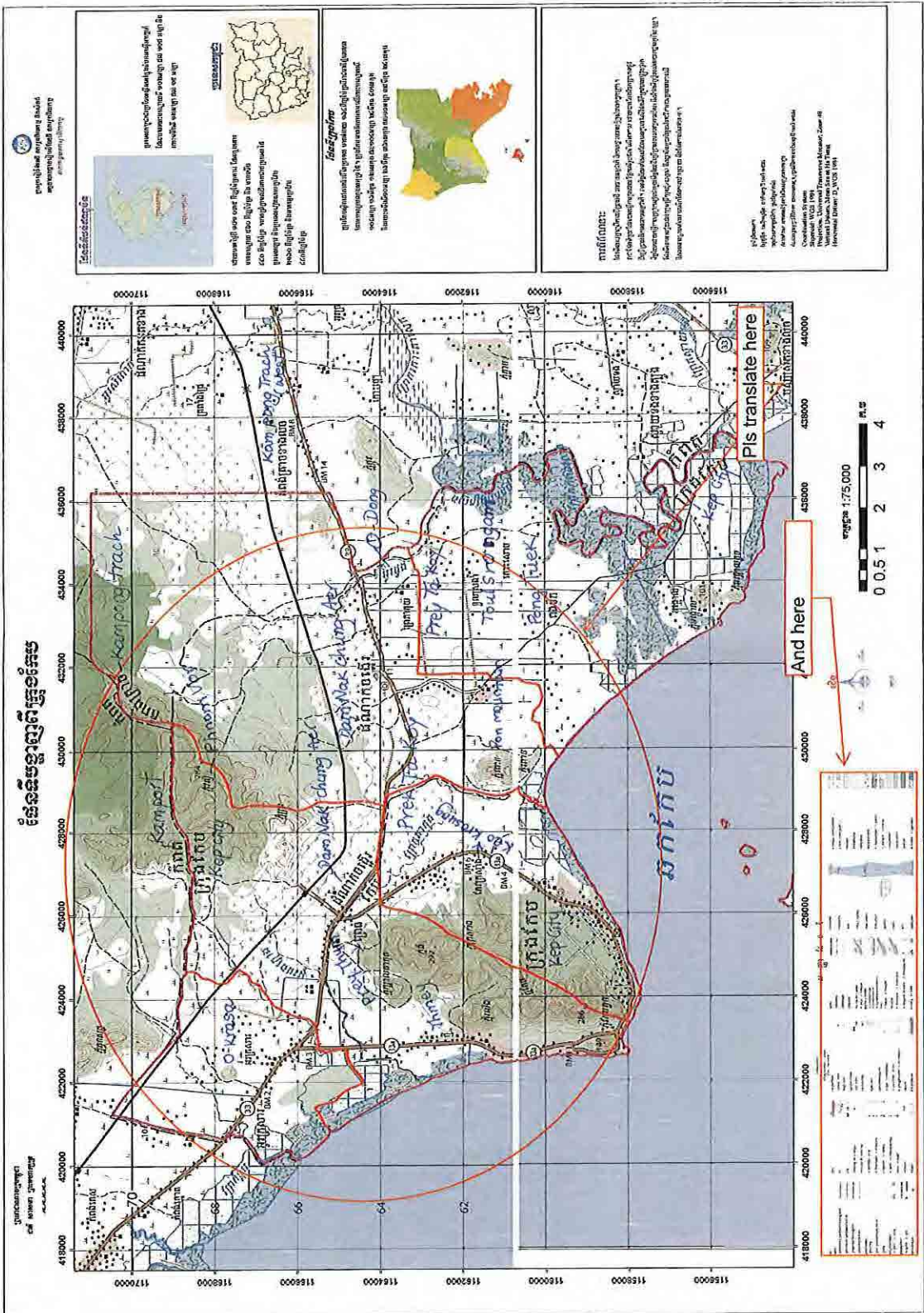


6. ケップの水道事業関連資料

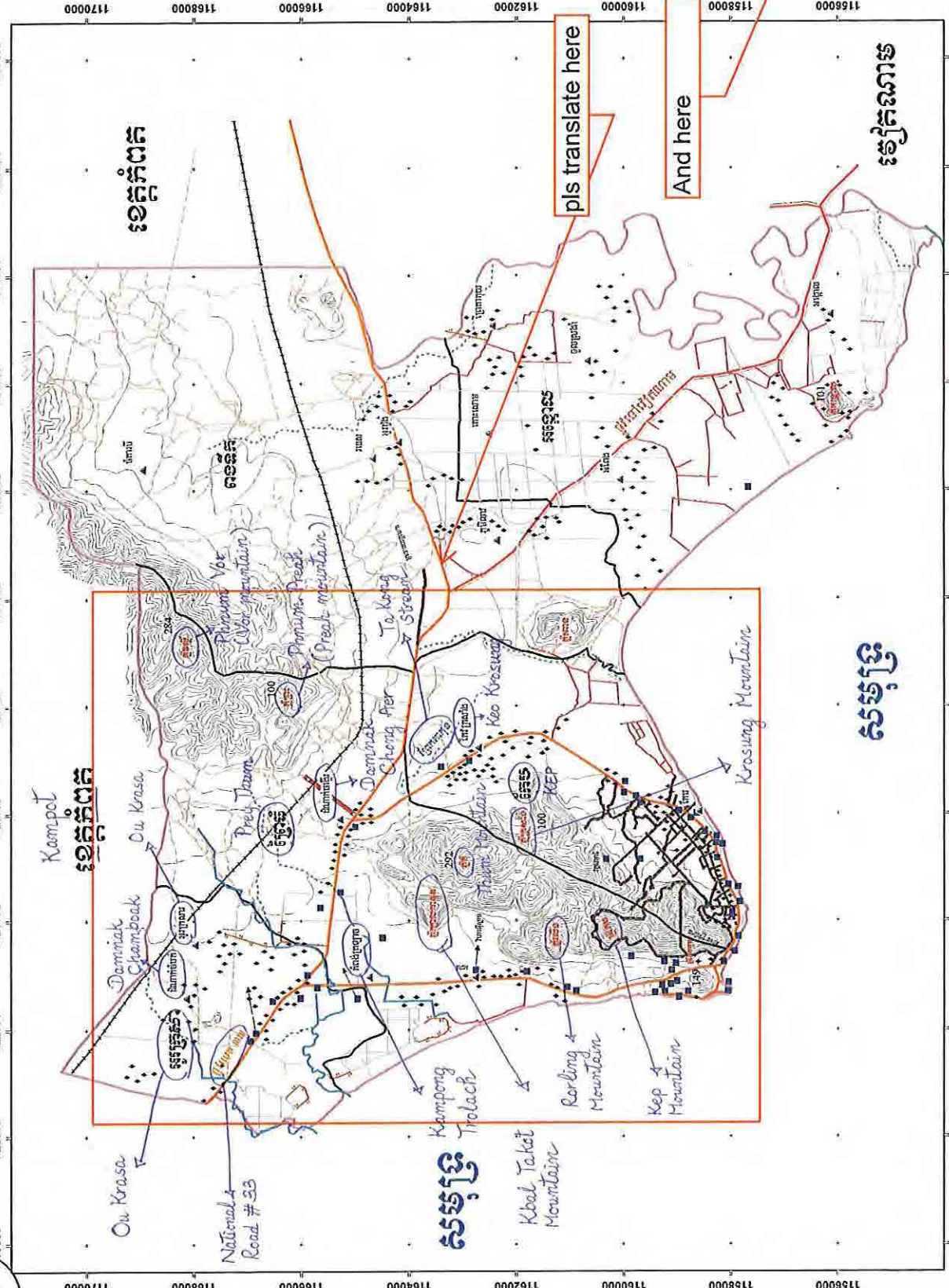
6.1.

ケップ計画地図

1



Please refer to attachment A



កម្រិតព្រំប្រទល់:
 ផែនទីនេះត្រូវបានរៀបចំឡើងដោយប្រើប្រាស់ទិន្នន័យផែនទីប្រភេទខ្ពស់។
 វាអាចមានកំហុសខ្លះៗដែលមិនអាចជៀសវាងបាន ដោយសារការប្រែប្រួលទិន្នន័យ
 ផែនទីប្រភេទខ្ពស់ដែលបានប្រើប្រាស់ក្នុងការរៀបចំផែនទីនេះ។
 យើងមិនទាន់ទទួលបានការអនុញ្ញាតឡើយ។

ស្វ័យគុណ: 1:75,000

0 0.5 1 2 3 4 5 ៥

៦-2

ផែនទីស្ថិតិសាស្ត្រ

ក្រសួងស្ថាប័នប្រចាំរដ្ឋ
 កម្ពុជា
 ក្រសួងស្ថាប័នប្រចាំរដ្ឋ
 ក្រសួងស្ថាប័នប្រចាំរដ្ឋ

ផែនទីស្ថិតិសាស្ត្រ
 ផែនទីស្ថិតិសាស្ត្រ
 ផែនទីស្ថិតិសាស្ត្រ
 ផែនទីស្ថិតិសាស្ត្រ

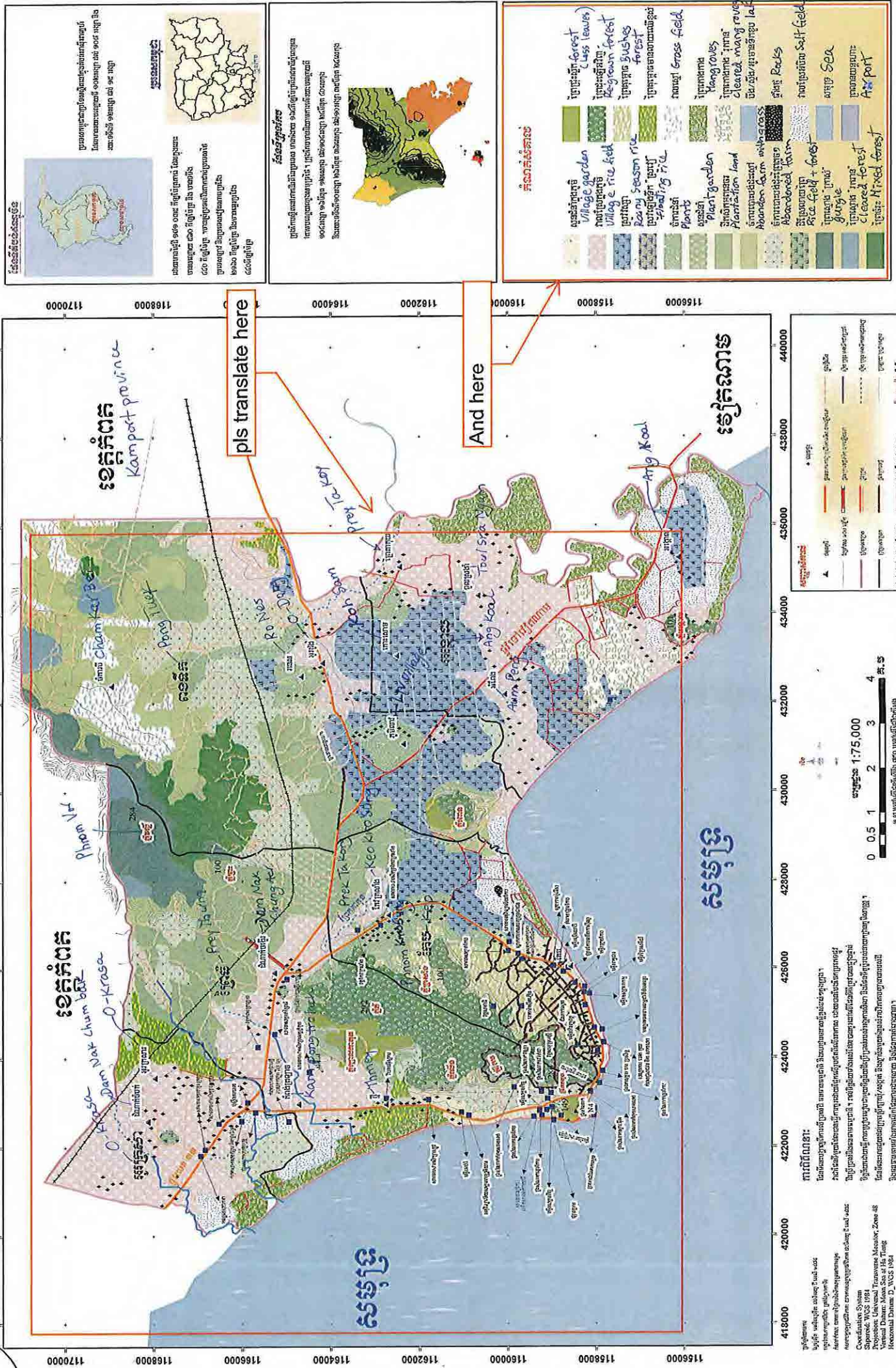
ផែនទីស្ថិតិសាស្ត្រ

ផែនទីស្ថិតិសាស្ត្រ
 ផែនទីស្ថិតិសាស្ត្រ
 ផែនទីស្ថិតិសាស្ត្រ
 ផែនទីស្ថិតិសាស្ត្រ

កំណត់សម្គាល់

▲	ភ្នំភ្នំ	Villages
●	ផ្ទះ	Houses
—	ផ្លូវជាតិលេខ ១	City road
—	ផ្លូវជាតិលេខ ២	Gravel
—	ផ្លូវជាតិលេខ ៣	Gravel
—	ផ្លូវជាតិលេខ ៤	Gravel
—	ផ្លូវជាតិលេខ ៥	Gravel
—	ផ្លូវជាតិលេខ ៦	Gravel
—	ផ្លូវជាតិលេខ ៧	Gravel
—	ផ្លូវជាតិលេខ ៨	Gravel
—	ផ្លូវជាតិលេខ ៩	Gravel
—	ផ្លូវជាតិលេខ ១០	Gravel
—	ផ្លូវជាតិលេខ ១១	Gravel
—	ផ្លូវជាតិលេខ ១២	Gravel
—	ផ្លូវជាតិលេខ ១៣	Gravel
—	ផ្លូវជាតិលេខ ១៤	Gravel
—	ផ្លូវជាតិលេខ ១៥	Gravel
—	ផ្លូវជាតិលេខ ១៦	Gravel
—	ផ្លូវជាតិលេខ ១៧	Gravel
—	ផ្លូវជាតិលេខ ១៨	Gravel
—	ផ្លូវជាតិលេខ ១៩	Gravel
—	ផ្លូវជាតិលេខ ២០	Gravel
—	ផ្លូវជាតិលេខ ២១	Gravel
—	ផ្លូវជាតិលេខ ២២	Gravel
—	ផ្លូវជាតិលេខ ២៣	Gravel
—	ផ្លូវជាតិលេខ ២៤	Gravel
—	ផ្លូវជាតិលេខ ២៥	Gravel
—	ផ្លូវជាតិលេខ ២៦	Gravel
—	ផ្លូវជាតិលេខ ២៧	Gravel
—	ផ្លូវជាតិលេខ ២៨	Gravel
—	ផ្លូវជាតិលេខ ២៩	Gravel
—	ផ្លូវជាតិលេខ ៣០	Gravel
—	ផ្លូវជាតិលេខ ៣១	Gravel
—	ផ្លូវជាតិលេខ ៣២	Gravel
—	ផ្លូវជាតិលេខ ៣៣	Gravel
—	ផ្លូវជាតិលេខ ៣៤	Gravel
—	ផ្លូវជាតិលេខ ៣៥	Gravel
—	ផ្លូវជាតិលេខ ៣៦	Gravel
—	ផ្លូវជាតិលេខ ៣៧	Gravel
—	ផ្លូវជាតិលេខ ៣៨	Gravel
—	ផ្លូវជាតិលេខ ៣៩	Gravel
—	ផ្លូវជាតិលេខ ៤០	Gravel
—	ផ្លូវជាតិលេខ ៤១	Gravel
—	ផ្លូវជាតិលេខ ៤២	Gravel
—	ផ្លូវជាតិលេខ ៤៣	Gravel
—	ផ្លូវជាតិលេខ ៤៤	Gravel
—	ផ្លូវជាតិលេខ ៤៥	Gravel
—	ផ្លូវជាតិលេខ ៤៦	Gravel
—	ផ្លូវជាតិលេខ ៤៧	Gravel
—	ផ្លូវជាតិលេខ ៤៨	Gravel
—	ផ្លូវជាតិលេខ ៤៩	Gravel
—	ផ្លូវជាតិលេខ ៥០	Gravel
—	ផ្លូវជាតិលេខ ៥១	Gravel
—	ផ្លូវជាតិលេខ ៥២	Gravel
—	ផ្លូវជាតិលេខ ៥៣	Gravel
—	ផ្លូវជាតិលេខ ៥៤	Gravel
—	ផ្លូវជាតិលេខ ៥៥	Gravel
—	ផ្លូវជាតិលេខ ៥៦	Gravel
—	ផ្លូវជាតិលេខ ៥៧	Gravel
—	ផ្លូវជាតិលេខ ៥៨	Gravel
—	ផ្លូវជាតិលេខ ៥៩	Gravel
—	ផ្លូវជាតិលេខ ៦០	Gravel
—	ផ្លូវជាតិលេខ ៦១	Gravel
—	ផ្លូវជាតិលេខ ៦២	Gravel
—	ផ្លូវជាតិលេខ ៦៣	Gravel
—	ផ្លូវជាតិលេខ ៦៤	Gravel
—	ផ្លូវជាតិលេខ ៦៥	Gravel
—	ផ្លូវជាតិលេខ ៦៦	Gravel
—	ផ្លូវជាតិលេខ ៦៧	Gravel
—	ផ្លូវជាតិលេខ ៦៨	Gravel
—	ផ្លូវជាតិលេខ ៦៩	Gravel
—	ផ្លូវជាតិលេខ ៧០	Gravel
—	ផ្លូវជាតិលេខ ៧១	Gravel
—	ផ្លូវជាតិលេខ ៧២	Gravel
—	ផ្លូវជាតិលេខ ៧៣	Gravel
—	ផ្លូវជាតិលេខ ៧៤	Gravel
—	ផ្លូវជាតិលេខ ៧៥	Gravel
—	ផ្លូវជាតិលេខ ៧៦	Gravel
—	ផ្លូវជាតិលេខ ៧៧	Gravel
—	ផ្លូវជាតិលេខ ៧៨	Gravel
—	ផ្លូវជាតិលេខ ៧៩	Gravel
—	ផ្លូវជាតិលេខ ៨០	Gravel
—	ផ្លូវជាតិលេខ ៨១	Gravel
—	ផ្លូវជាតិលេខ ៨២	Gravel
—	ផ្លូវជាតិលេខ ៨៣	Gravel
—	ផ្លូវជាតិលេខ ៨៤	Gravel
—	ផ្លូវជាតិលេខ ៨៥	Gravel
—	ផ្លូវជាតិលេខ ៨៦	Gravel
—	ផ្លូវជាតិលេខ ៨៧	Gravel
—	ផ្លូវជាតិលេខ ៨៨	Gravel
—	ផ្លូវជាតិលេខ ៨៩	Gravel
—	ផ្លូវជាតិលេខ ៩០	Gravel
—	ផ្លូវជាតិលេខ ៩១	Gravel
—	ផ្លូវជាតិលេខ ៩២	Gravel
—	ផ្លូវជាតិលេខ ៩៣	Gravel
—	ផ្លូវជាតិលេខ ៩៤	Gravel
—	ផ្លូវជាតិលេខ ៩៥	Gravel
—	ផ្លូវជាតិលេខ ៩៦	Gravel
—	ផ្លូវជាតិលេខ ៩៧	Gravel
—	ផ្លូវជាតិលេខ ៩៨	Gravel
—	ផ្លូវជាតិលេខ ៩៩	Gravel
—	ផ្លូវជាតិលេខ ១០០	Gravel

① Altitude of 10m and above
 ② Paved road with width of more than 5m
 ③ Gravel with width of more than 5m
 ④ Track with width of less than 2.5m
 ⑤ Stream that has water the whole year
 ⑥ Stream that has water only in rainy season



ផែនទីស្ថិតិសាស្ត្រ

ប្រជាជនសរុបនៅក្នុងតំបន់ស្រុកកំពង់
ស្រុកកំពង់មានប្រជាជនសរុប ១០០ ០០០ នាក់ ដែល
មានប្រជាជន ១០ ០០០ នាក់ ក្នុងមួយគីឡូម៉ែត្រការ៉េ។

ផ្ទៃសរុបស្រុកកំពង់
ស្រុកកំពង់មានផ្ទៃសរុប ១០ ០០០ គីឡូម៉ែត្រការ៉េ។

ផ្ទៃដីសរុបស្រុកកំពង់
ស្រុកកំពង់មានផ្ទៃដីសរុប ១០ ០០០ គីឡូម៉ែត្រការ៉េ។

ផែនទីប្រភេទដី

ប្រភេទដីសរុបស្រុកកំពង់ មានប្រភេទដីសរុប ១០ ០០០ គីឡូម៉ែត្រការ៉េ។

ប្រភេទដីសរុបស្រុកកំពង់ មានប្រភេទដីសរុប ១០ ០០០ គីឡូម៉ែត្រការ៉េ។

ប្រភេទដីសរុបស្រុកកំពង់ មានប្រភេទដីសរុប ១០ ០០០ គីឡូម៉ែត្រការ៉េ។

កំណត់សំគាល់

ប្រភេទដីសរុបស្រុកកំពង់ មានប្រភេទដីសរុប ១០ ០០០ គីឡូម៉ែត្រការ៉េ។

ប្រភេទដីសរុបស្រុកកំពង់ មានប្រភេទដីសរុប ១០ ០០០ គីឡូម៉ែត្រការ៉េ។

ប្រភេទដីសរុបស្រុកកំពង់ មានប្រភេទដីសរុប ១០ ០០០ គីឡូម៉ែត្រការ៉េ។

ស្នូល

ប្រភេទដីសរុបស្រុកកំពង់ មានប្រភេទដីសរុប ១០ ០០០ គីឡូម៉ែត្រការ៉េ។

ប្រភេទដីសរុបស្រុកកំពង់ មានប្រភេទដីសរុប ១០ ០០០ គីឡូម៉ែត្រការ៉េ។

ប្រភេទដីសរុបស្រុកកំពង់ មានប្រភេទដីសរុប ១០ ០០០ គីឡូម៉ែត្រការ៉េ។

ស្នូល

ប្រភេទដីសរុបស្រុកកំពង់ មានប្រភេទដីសរុប ១០ ០០០ គីឡូម៉ែត្រការ៉េ។

ប្រភេទដីសរុបស្រុកកំពង់ មានប្រភេទដីសរុប ១០ ០០០ គីឡូម៉ែត្រការ៉េ។

ប្រភេទដីសរុបស្រុកកំពង់ មានប្រភេទដីសរុប ១០ ០០០ គីឡូម៉ែត្រការ៉េ។

ស្នូល

ប្រភេទដីសរុបស្រុកកំពង់ មានប្រភេទដីសរុប ១០ ០០០ គីឡូម៉ែត្រការ៉េ។

ប្រភេទដីសរុបស្រុកកំពង់ មានប្រភេទដីសរុប ១០ ០០០ គីឡូម៉ែត្រការ៉េ។

ប្រភេទដីសរុបស្រុកកំពង់ មានប្រភេទដីសរុប ១០ ០០០ គីឡូម៉ែត្រការ៉េ។

ស្នូល

ប្រភេទដីសរុបស្រុកកំពង់ មានប្រភេទដីសរុប ១០ ០០០ គីឡូម៉ែត្រការ៉េ។

ប្រភេទដីសរុបស្រុកកំពង់ មានប្រភេទដីសរុប ១០ ០០០ គីឡូម៉ែត្រការ៉េ។

ប្រភេទដីសរុបស្រុកកំពង់ មានប្រភេទដីសរុប ១០ ០០០ គីឡូម៉ែត្រការ៉េ។

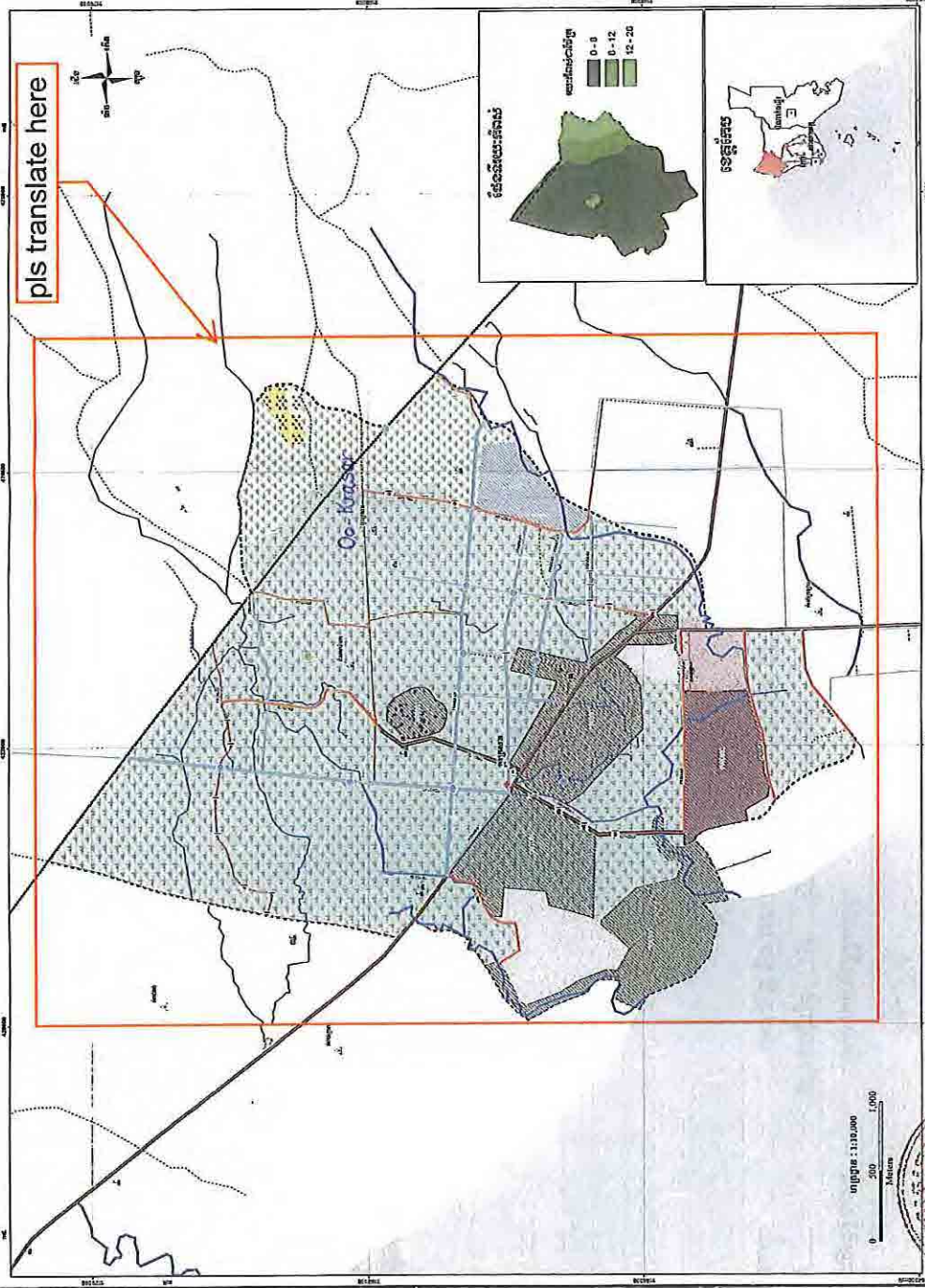
ផែនទីប្រើប្រាស់ដីពេលអនាគត ឃុំក្រសាន់ ឆ្នាំ ២០០៩ ~ ២០២២

Future Land Use Map of Ou Krasa Commune for Year 2009 - 2022 (230102)

And here This part is already translated

សញ្ញាណកម្ម (Legend)

- ២៤ បឹងប្រទេស (National Pond)
- ២៥ ផ្លូវជាតិ (National Road)
- ២៦ ផ្លូវជាតិលេខ១ (National Road No. 1)
- ២៧ ផ្លូវជាតិលេខ២ (National Road No. 2)
- ២៨ ផ្លូវជាតិលេខ៣ (National Road No. 3)
- ២៩ ផ្លូវជាតិលេខ៤ (National Road No. 4)
- ៣០ ផ្លូវជាតិលេខ៥ (National Road No. 5)
- ៣១ ផ្លូវជាតិលេខ៦ (National Road No. 6)
- ៣២ ផ្លូវជាតិលេខ៧ (National Road No. 7)
- ៣៣ ផ្លូវជាតិលេខ៨ (National Road No. 8)
- ៣៤ ផ្លូវជាតិលេខ៩ (National Road No. 9)
- ៣៥ ផ្លូវជាតិលេខ១០ (National Road No. 10)
- ៣៦ ផ្លូវជាតិលេខ១១ (National Road No. 11)
- ៣៧ ផ្លូវជាតិលេខ១២ (National Road No. 12)
- ៣៨ ផ្លូវជាតិលេខ១៣ (National Road No. 13)
- ៣៩ ផ្លូវជាតិលេខ១៤ (National Road No. 14)
- ៤០ ផ្លូវជាតិលេខ១៥ (National Road No. 15)
- ៤១ ផ្លូវជាតិលេខ១៦ (National Road No. 16)
- ៤២ ផ្លូវជាតិលេខ១៧ (National Road No. 17)
- ៤៣ ផ្លូវជាតិលេខ១៨ (National Road No. 18)
- ៤៤ ផ្លូវជាតិលេខ១៩ (National Road No. 19)
- ៤៥ ផ្លូវជាតិលេខ២០ (National Road No. 20)



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សញ្ញាណកម្ម (Legend)

- ១០០១ ទឹកស្រទៅ (Water)
- ១០០២ ដីស្រែ (Agriculture)
- ១០០៣ ដីស្រែស្រែកម្រិតខ្ពស់ (High Level Agriculture)
- ១០០៤ ដីស្រែស្រែកម្រិតទាប (Low Level Agriculture)
- ១០០៥ ដីស្រែស្រែកម្រិតកណ្តាល (Medium Level Agriculture)
- ១០០៦ ដីស្រែស្រែកម្រិតខ្ពស់ (High Level Agriculture)
- ១០០៧ ដីស្រែស្រែកម្រិតទាប (Low Level Agriculture)
- ១០០៨ ដីស្រែស្រែកម្រិតកណ្តាល (Medium Level Agriculture)
- ១០០៩ ដីស្រែស្រែកម្រិតខ្ពស់ (High Level Agriculture)
- ១០១០ ដីស្រែស្រែកម្រិតទាប (Low Level Agriculture)
- ១០១១ ដីស្រែស្រែកម្រិតកណ្តាល (Medium Level Agriculture)
- ១០១២ ដីស្រែស្រែកម្រិតខ្ពស់ (High Level Agriculture)
- ១០១៣ ដីស្រែស្រែកម្រិតទាប (Low Level Agriculture)
- ១០១៤ ដីស្រែស្រែកម្រិតកណ្តាល (Medium Level Agriculture)
- ១០១៥ ដីស្រែស្រែកម្រិតខ្ពស់ (High Level Agriculture)
- ១០១៦ ដីស្រែស្រែកម្រិតទាប (Low Level Agriculture)
- ១០១៧ ដីស្រែស្រែកម្រិតកណ្តាល (Medium Level Agriculture)
- ១០១៨ ដីស្រែស្រែកម្រិតខ្ពស់ (High Level Agriculture)
- ១០១៩ ដីស្រែស្រែកម្រិតទាប (Low Level Agriculture)
- ១០២០ ដីស្រែស្រែកម្រិតកណ្តាល (Medium Level Agriculture)

បញ្ជាក់ (Notes):

- ១- ទិន្នន័យនេះត្រូវបានកែតម្រូវឡើងវិញដោយយោងទៅលើទិន្នន័យដើម។
- ២- ទិន្នន័យនេះមិនរាប់បញ្ចូលទាំងផ្ទៃដីស្រែស្រែកម្រិតខ្ពស់ និងផ្ទៃដីស្រែស្រែកម្រិតទាបនោះទេ។
- ៣- ទិន្នន័យនេះមិនរាប់បញ្ចូលទាំងផ្ទៃដីស្រែស្រែកម្រិតកណ្តាលនោះទេ។

អ្នកប្រកាស (Author): **ក្រុមហ៊ុន ភ្នំពេញ**

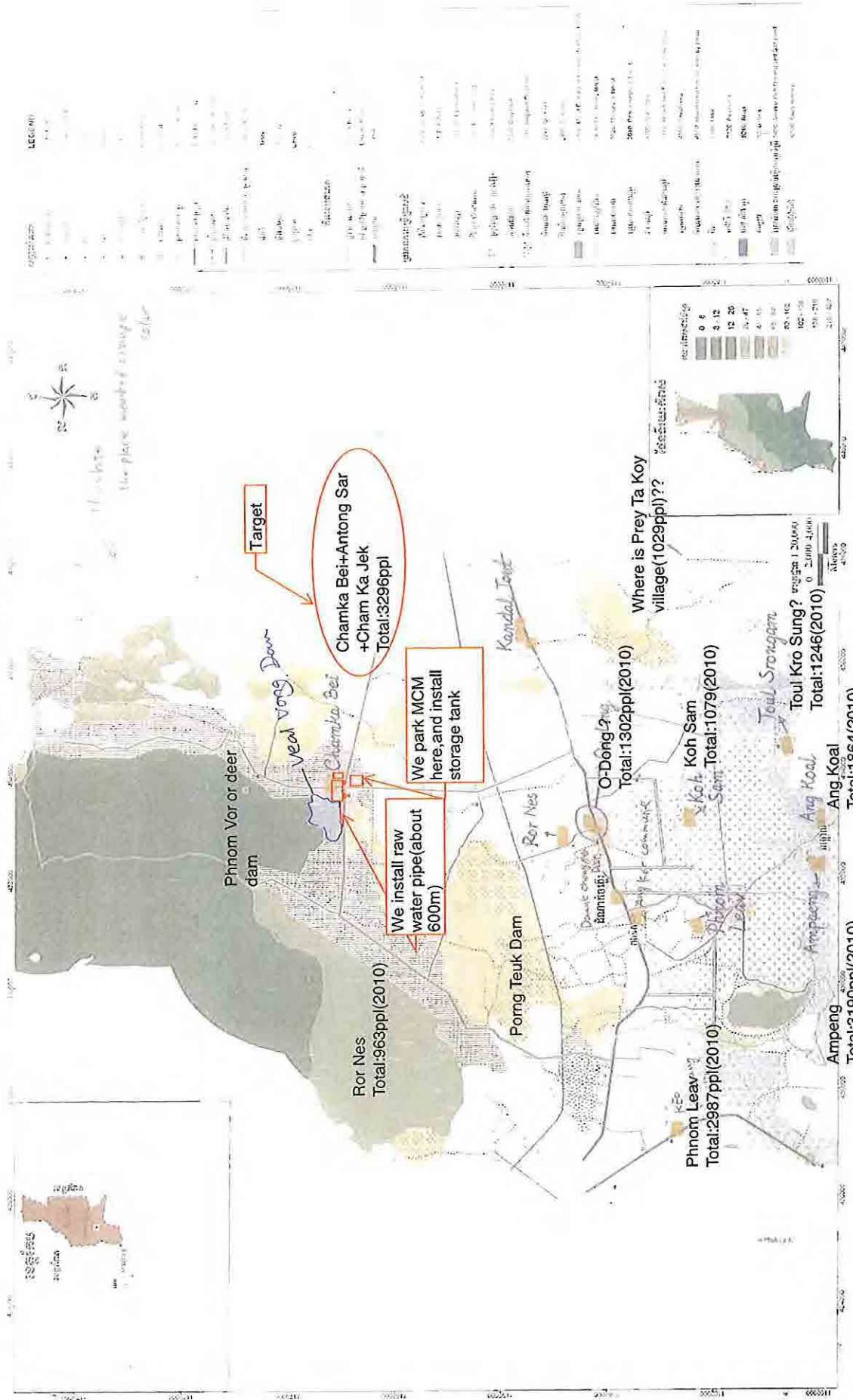
ស្ថាប័ន (Institution): **ក្រុមហ៊ុន ភ្នំពេញ**

កាលបរិច្ឆេទ (Date): **២០០៩**

ទីតាំង (Location): **ឃុំក្រសាន់**

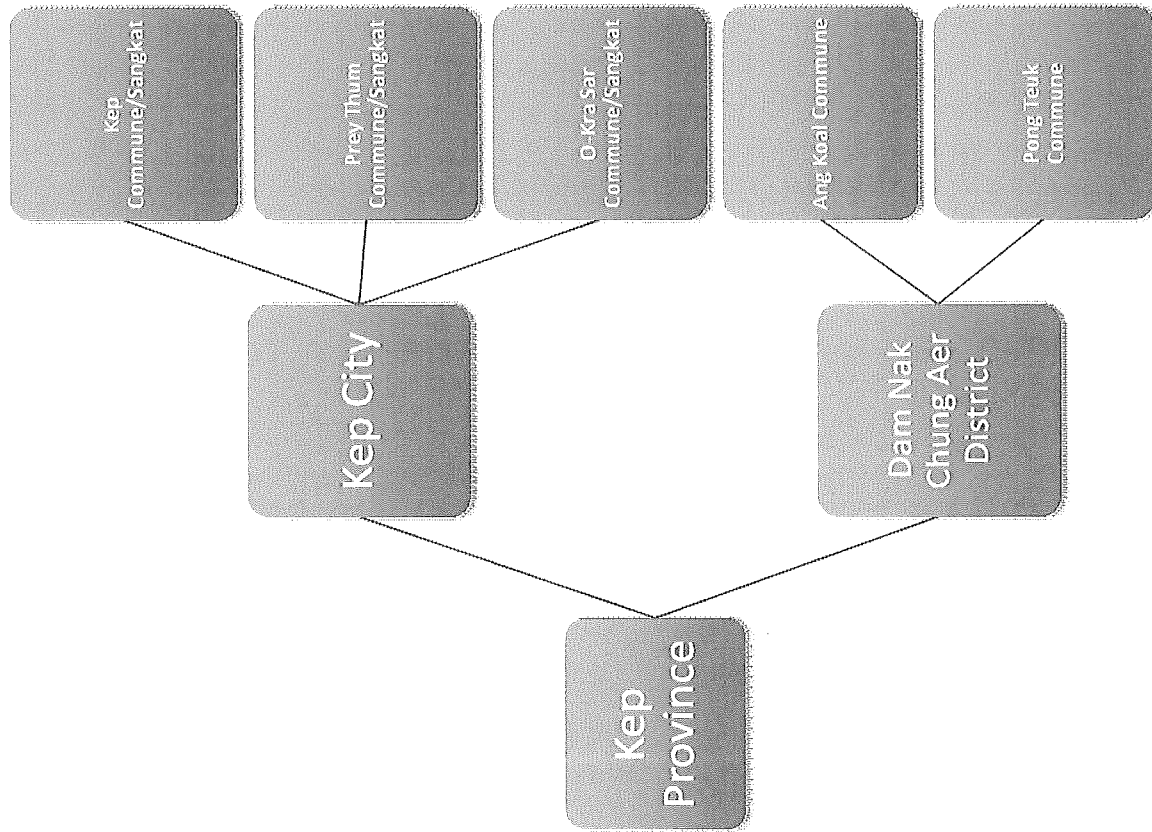
ផែនទី គំរោងហេដ្ឋារចនាសម្ព័ន្ធអនាគាត ឃុំពនឺត ឆ្នាំ២០២២

Future Infrastructure Map of Phnom Tuek Commune (230103) 2022



6.2.

ケップ人口資料



Kep Commune	Total Population		Total families	
	2009	2010	2009	2010
Kep village	2.491	2.649	523	556
Keo Krosung village	1.981	436	436	483

Prey Thum Commune	Total Population		Total families	
	2009	2010	2009	2010
Dam Nak Chung Aer village	3.389	3.458	639	669
Kompong Trolach village	1.877	2.043	389	423
Thmey village	2.506	2.335	602	541

O-Krosar Commune	Total Population		Total families	
	2009	2010	2009	2010
O-Krosar village	3.687	3.928	723	802
Dam Nak Cham Bak village	3.178	3.271	680	695

Ang Koal Commune	Total Population		Total families	
	2009	2010	2009	2010
Aum Peng village	3.125	3.19	688	701
Toul Srongam village	1.126	1.246	227	266
Koh Sam village	1.079	1.133	187	199
Ang Koal village	1.864	1.923	374	385

Pong Teuk Commune	Total Population		Total families	
	2009	2010	2009	2010
O-Dong village	1.313	1.302	293	292
Prey Ta Koy village	1.014	1.029	218	221
Phnom Liv village	2.987	3.082	625	666
Ro Nes village	913	963	196	220
Cham Ka Bai village	2.849	3.007	604	660

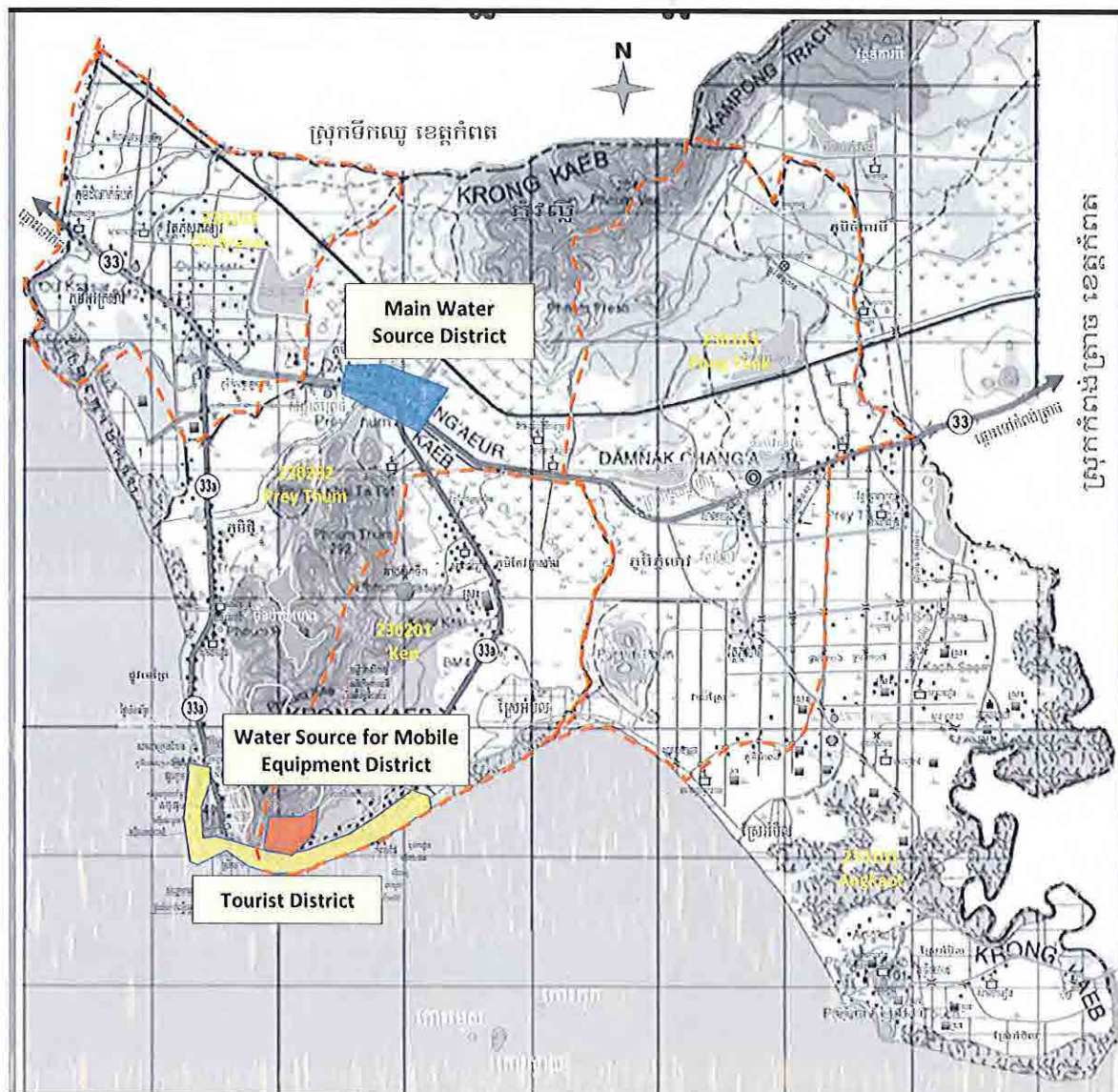
Cham Ka Bai village is split into other 2 villages (Antong Sar+Chamka Jek)

6.3.

ケップ上水道計画資料

Service Area of Kep 2015

2/15



Frame Data (2015) of Water Supply in KEP City

Items	Domestic	Tourist		Total
		Domestic	Foreigner	
Population	38,523	3,049	23	41,595
Coverage population of Water supply	5,460	2,744	23	8,227
Coverage ratio of water supply	14.2%	90.0%	100.0%	-
Unit of Water Consumption (l/day)	80	120	250	-
Water Consumption (m3/Day)	437	329	6	772
Revenue ratio	90.0%	90.0%	90.0%	-
Average daily supply	486	366	7	859
Rate of loading	0.80	0.80	0.80	-
Maximum Daily Supply	608	458	9	1,075
Hourly Factor (peek factor)	1.6	1.6	1.6	-
Hourly Maximum Supply (m3/h)	40.53	30.53	0.60	71.66

Frame Data (2030) of Water Supply in KEP City

Items	Domestic	Tourist		Total
		Domestic	Foreigner	
Population	44,874	8,319	62	53,255
Coverage population of Water supply	39,360	8,319	62	47,741
Coverage ratio of water supply	87.7%	100.0%	100.0%	-
Unit of Water Consumption (l/day)	120	120	250	-
Water Consumption (m3/Day)	4,723	998	16	5,737
Revenue ratio	90.0%	90.0%	90.0%	-
Average daily supply	5,248	1,109	18	6,375
Rate of loading	0.80	0.80	0.80	-
Maximum Daily Supply	6,560	1,386	23	7,969
Hourly Factor (peek factor)	1.6	1.6	1.6	-
Hourly Maximum Supply (m3/h)	437	92	2	531

Situation of Domestic and Tourist in 2008

Code	District / Commune	Domestic			Tourist			
		Population	Served		Domestic		Foreigner	
			Families	P/F	Number	%	Number	%
230101	Angkaol	7,464	1,450	5.1	0	0%	0	0%
230102	Ou Krasar	6,868	1,344	5.1	0	0%	0	0%
230103	Pong Tuek	8,716	1,860	4.7	0	0%	0	0%
230201	Kep	4,678	970	4.8	470	50%	4	50%
230202	Prey Thum	8,027	1,612	5.0	471	50%	4	50%
	Total	35,753	7,236	4.9	941	100%	7	100%

Population Served of Water Supply in 2015

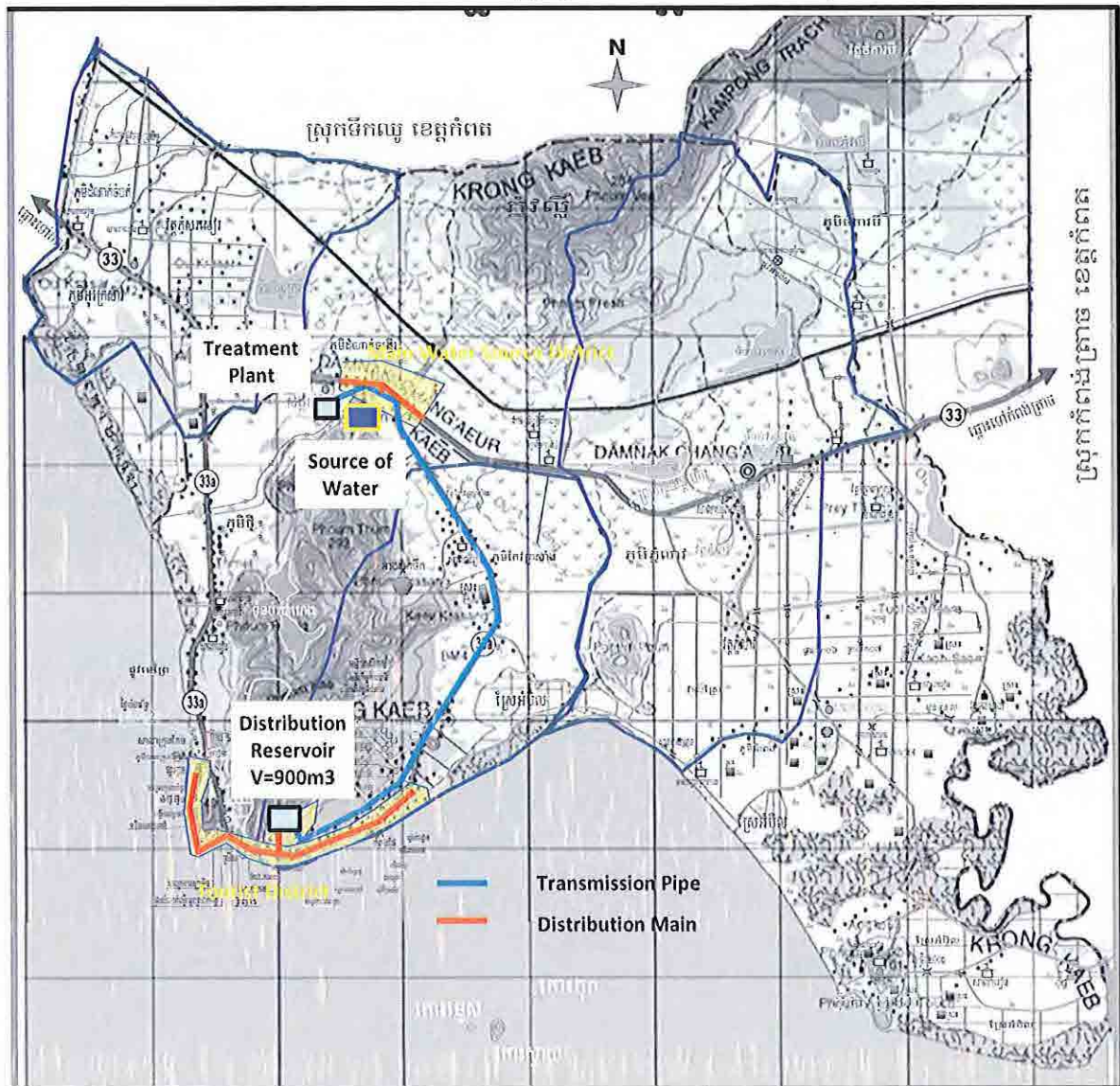
Code	District / Commune	Domestic				Tourist		
		Population	Served			Domestic	Foreigner	%
			Families	Population	%			
230101	Angkaol	8,044	0	0	0.0%	0	0	0%
230102	Ou Krasar	7,400	0	0	0.0%	0	0	0%
230103	Pong Tuek	9,392	0	0	0.0%	0	0	0%
230201	Kep	5,039	492	2,362	18.3%	1,372	12	50%
230202	Prey Thum	8,648	620	3,098	12.7%	1,372	11	50%
	Total	38,523	1112	5,460	14.2%	2,744	23	100%

It is added 400 families by the main water resource to the population of Prey Thum
 It is added 300 families by the sub water resource to the population of in Kep

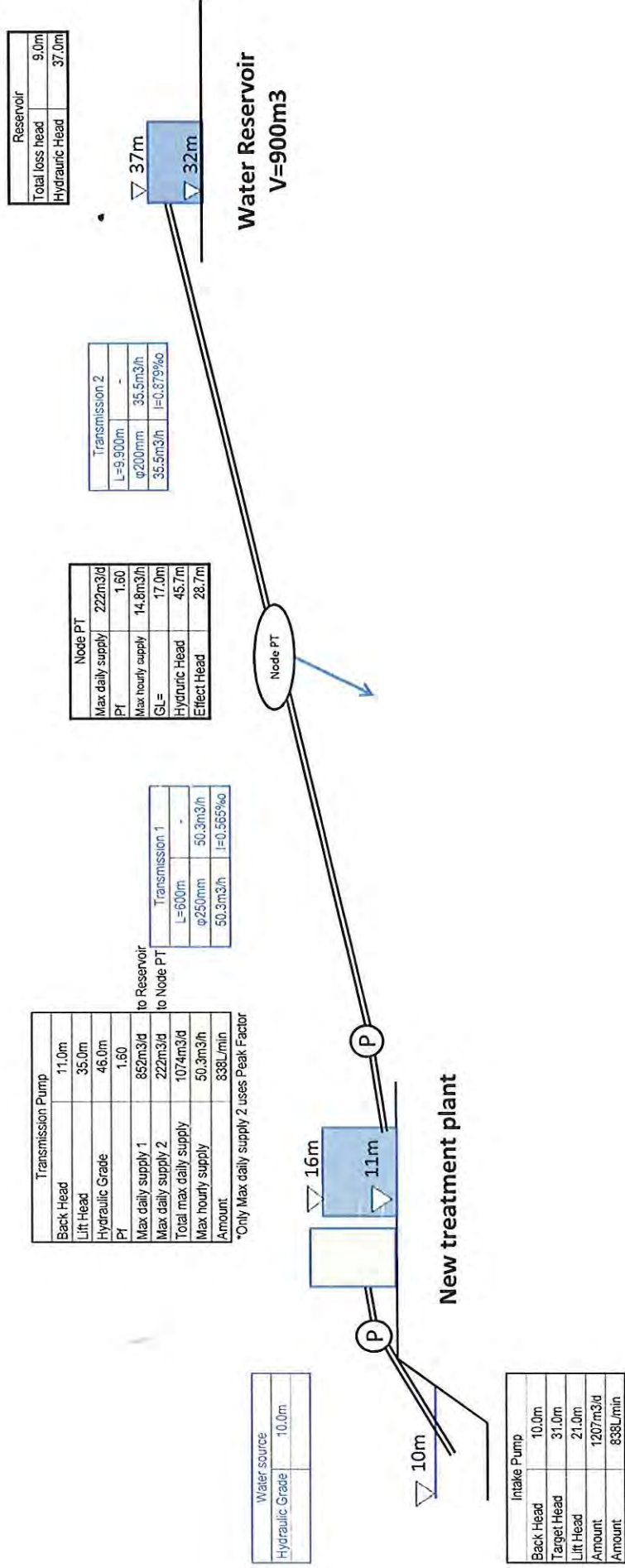
Population Served of Water Supply in 2030

Code	District / Commune	Domestic				Tourist		
		Population	Served			Domestic	Foreigner	%
			Families	Population	%			
230101	Angkaol	9,370	1,837	9,370	100.0%	1,664	12	20.0%
230102	Ou Krasar	8,620	1,690	8,620	100.0%	0	0	0.0%
230103	Pong Tuek	10,940	1,154	5,426	49.6%	832	6	10.0%
230201	Kep	5,870	1,223	5,870	100.0%	2,913	22	35.0%
230202	Prey Thum	10,074	2,015	10,074	100.0%	2,912	22	35.0%
	Total	44,874	7,919	39,360	87.7%	8,319	62	100.0%

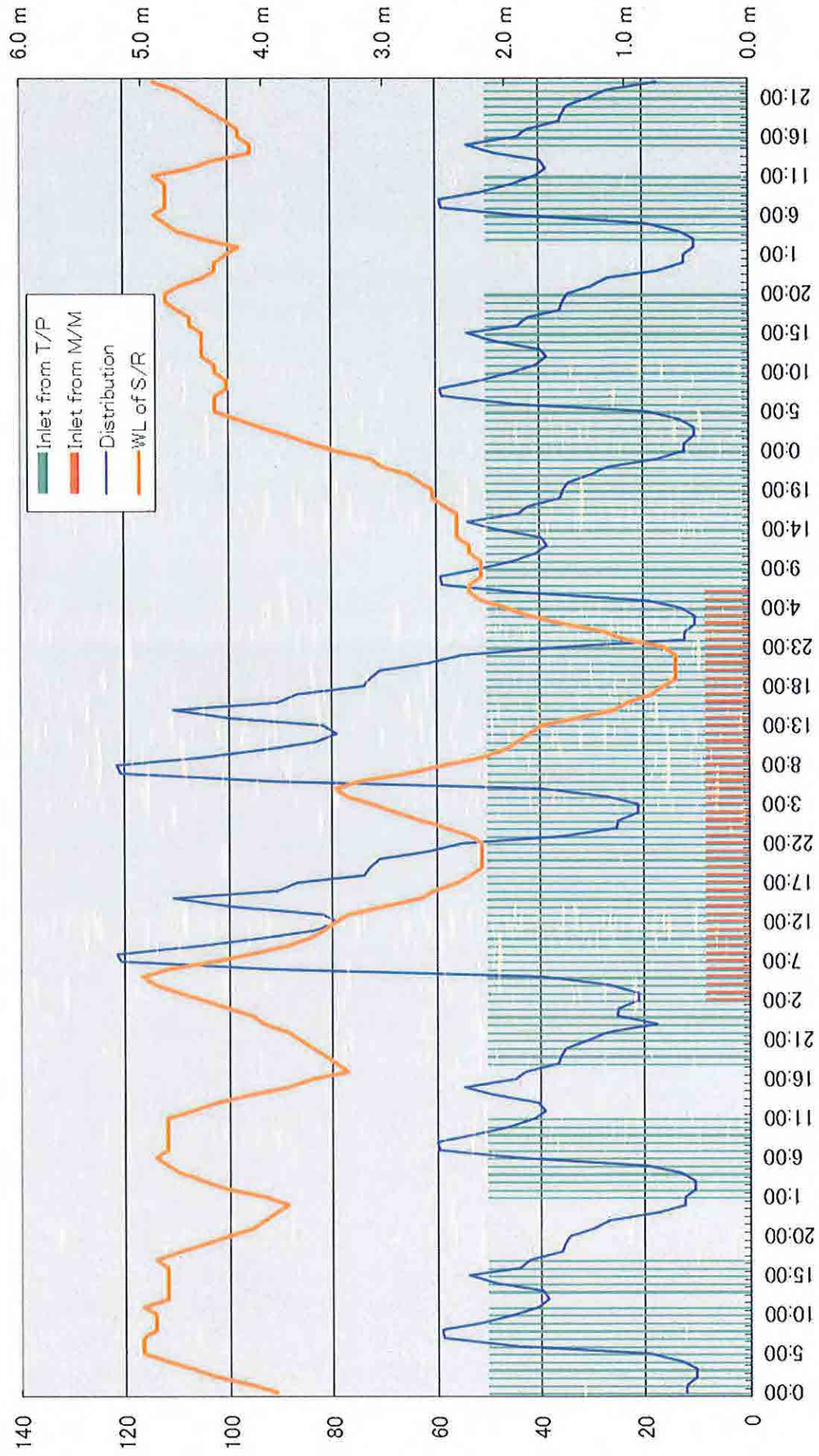
Outline of Water Supply Facilities of Kep 2015



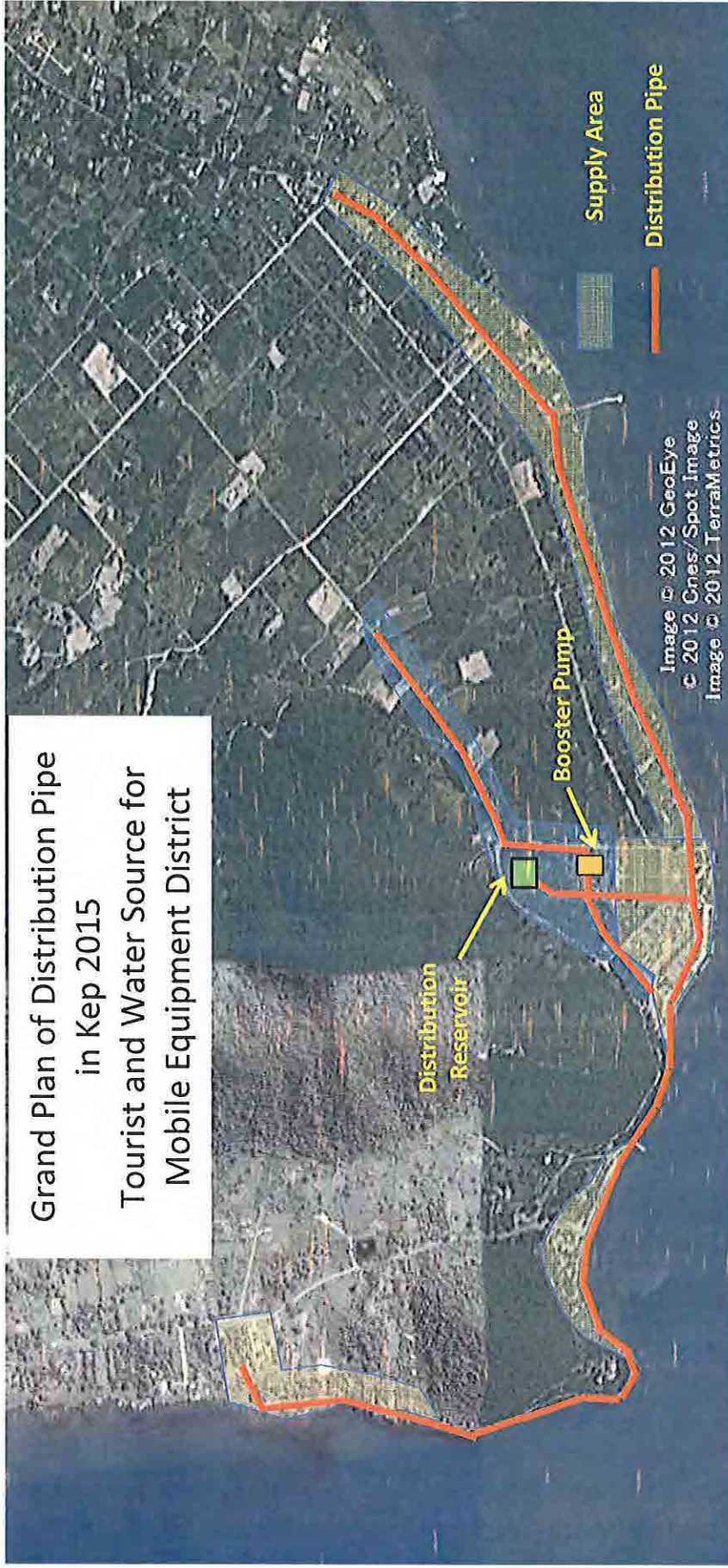
**Result of the Hydraulic Calculation
in Kep 2015
Transmission Pipe**



Capacity Estimation of Distribution Reservoir



Grand Plan of Distribution Pipe
in Kep 2015
Tourist and Water Source for
Mobile Equipment District



Cost estimation for the Transmission and Distribution Facilities in Kep 2015

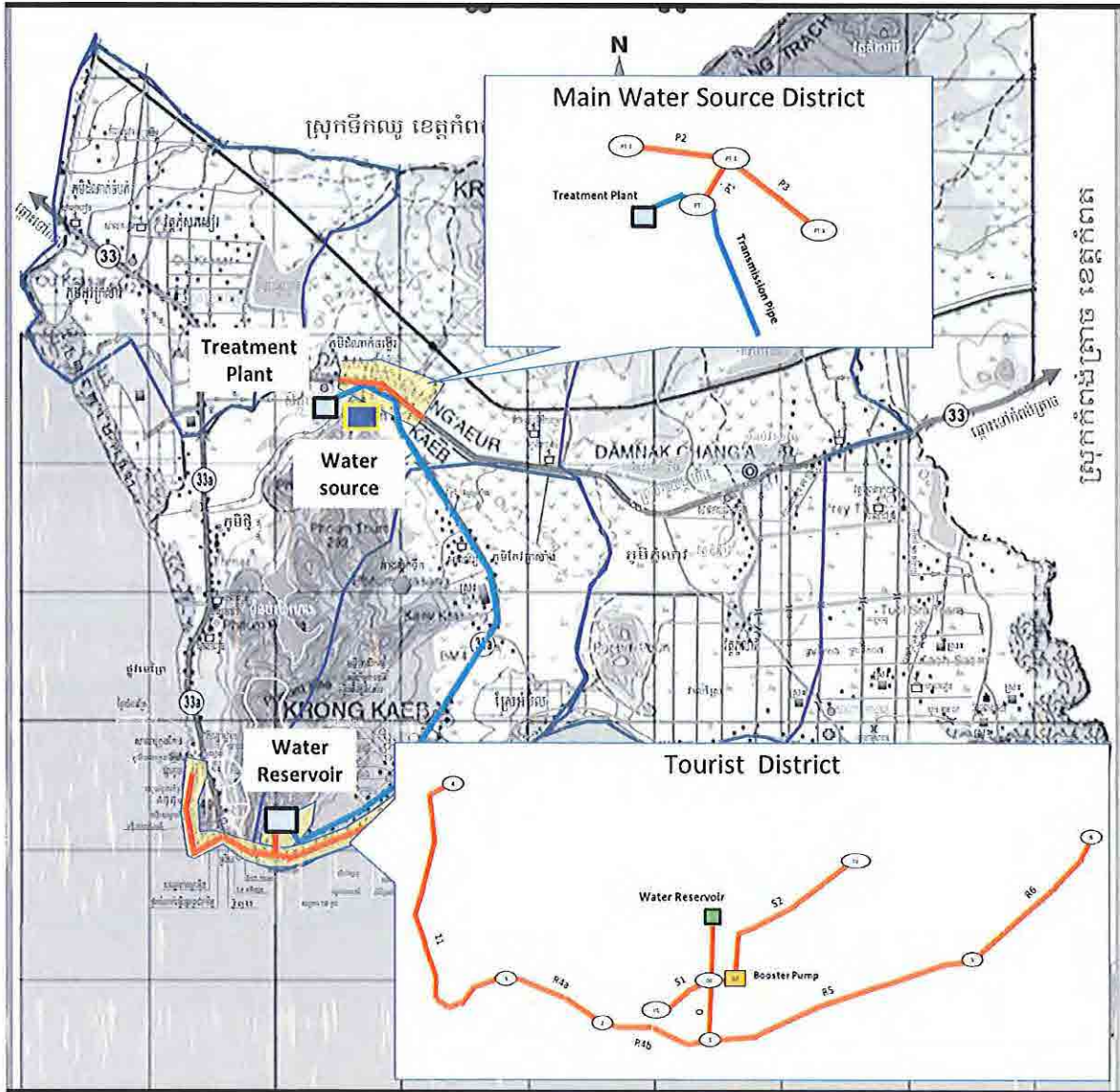
Item	Specification	Unit	amount	Unit Cost USD	Price USD
Pipe	Pe ϕ 250	m	600		
Pipe	Pe ϕ 200	m	10,490		
Pipe	Pe ϕ 150	m	1,040		
Pipe	Pe ϕ 100	m	4,490		
Pipe	Pe ϕ 80	m	1,060		
Pipe	Pe ϕ 50	m	3,000		
Total			20,680		
Sub total					
Water Reservoir	V=900m ³	set	1.00		
Sub total					
Booster Pump	Lift=23.9m, 28L/min	set	1.00		
Sub total					
TOTAL					

*Specification for the pumps

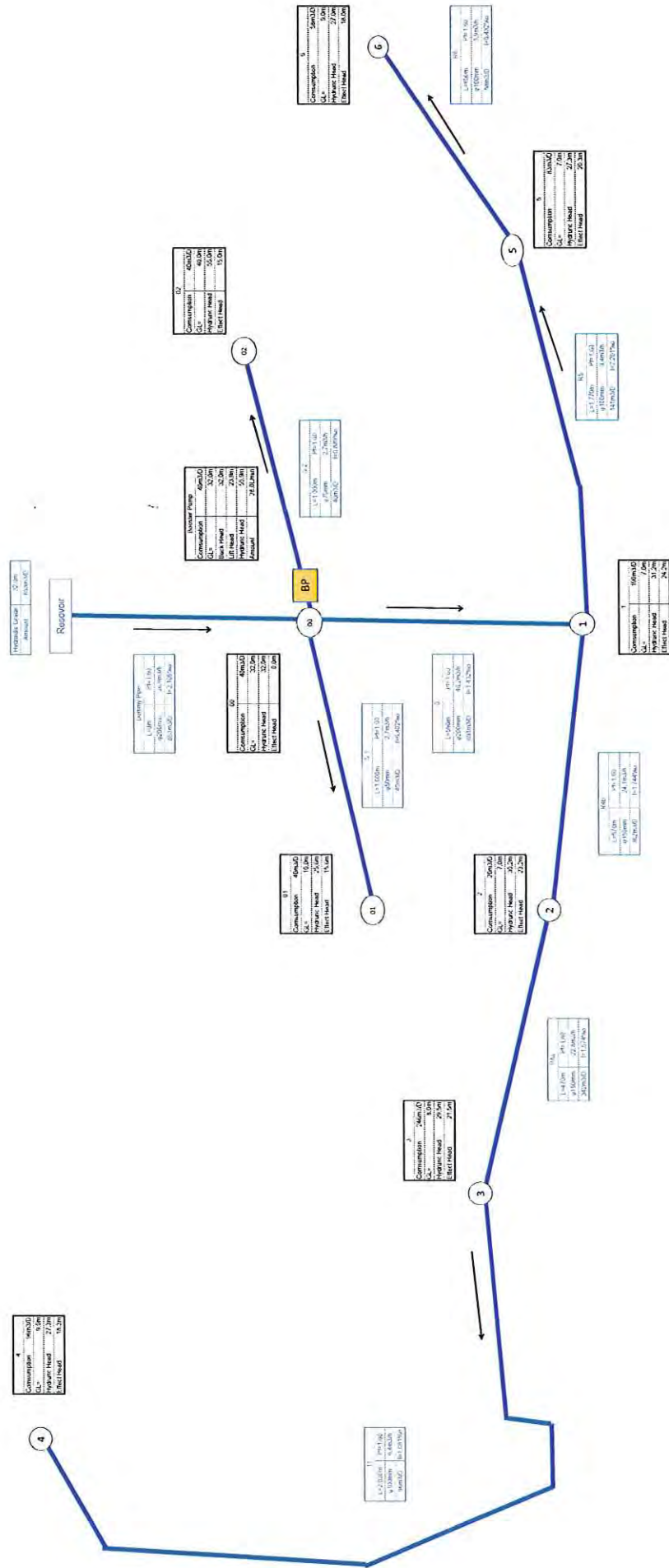
- Intake Pump : Q=838L/min
- Transmission Pump : Q=838L/min Lift 35m
- Distribution Booster Pump : Q=28L/min Lift 23.9m

Hydraulic Calculation in Kep 2015

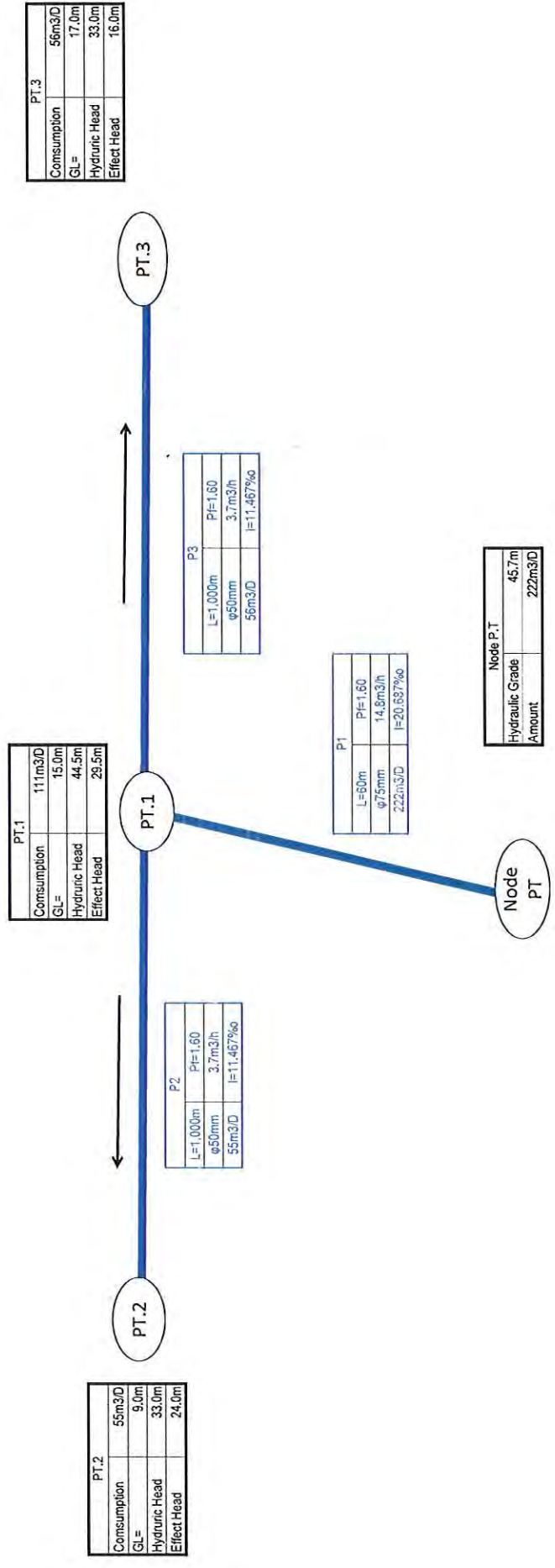
Schematic of Nodes and Pipes



**Result of the Hydraulic Calculation
in Kep 2015
Tourist District and
Water Source for Mobile Equipment District**



Result of the Hydraulic Calculation
in Kep 2015
Main Water Source District



Basic Data of the Hydraulic Calculation in Kep 2015
Tourist District and Water Source for Mobile Equipment District

Node Data

Node	Elevation	Max. Daily Supply
00	32	40
1	7	190
2	7	20
3	8	246
4	9	96
5	7	83
6	9	58
01	10	40
02	40	40
BP	32	40
		853

Pipe Data

Pipe Name	Length	Diameter
0	590	200
R4b	570	150
R4a	470	150
11	2,030	100
R5	1,770	100
R6	690	100
S1	1,000	50
S2	1,000	80
Total	8,120	

Basic Data of the Hydraulic Calculation in Kep 2015
Main Water Source District

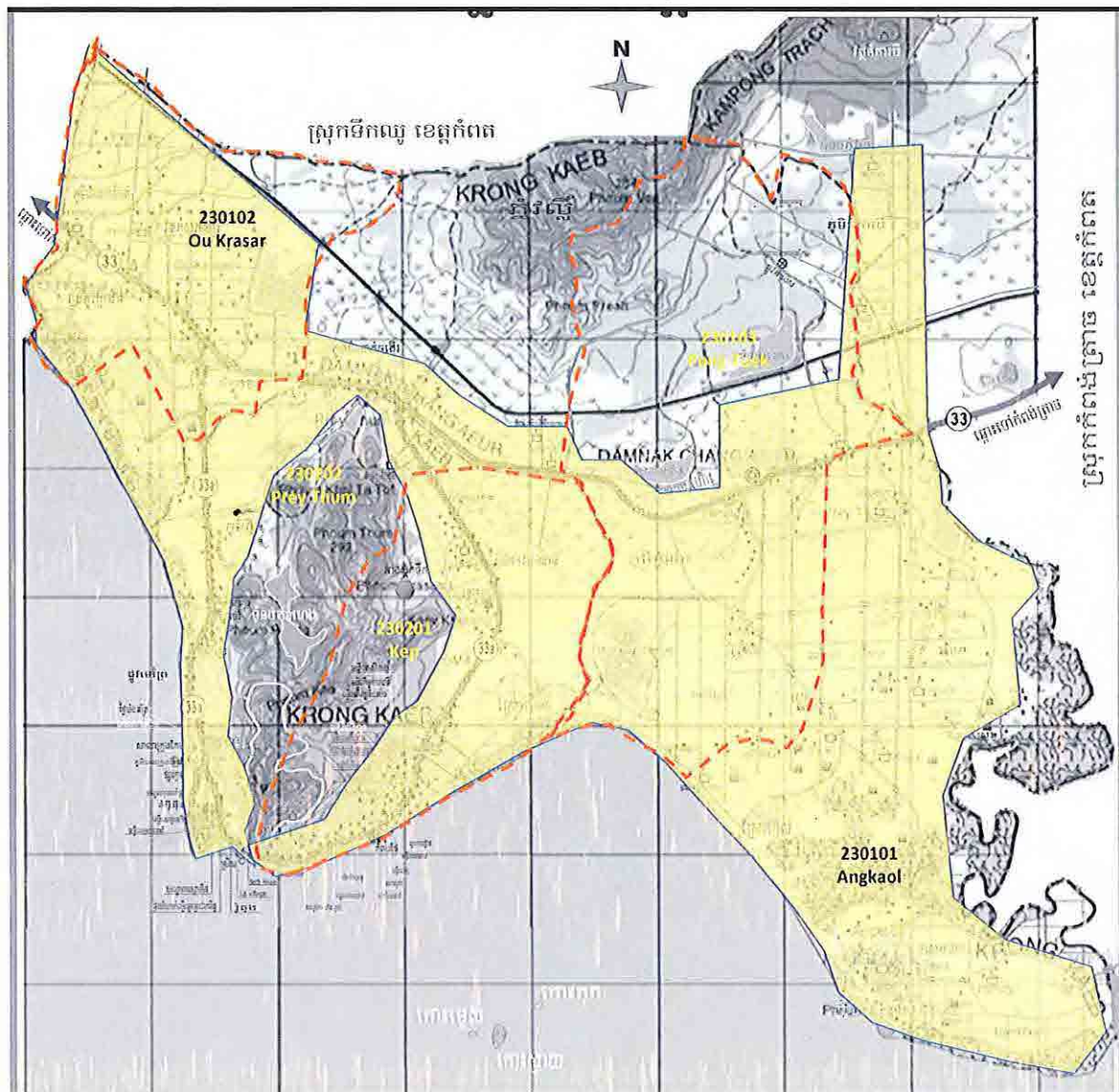
Node Data

Node	Elevation	Max. Daily Supply
PT.1	15	111
PT.2	9	55
PT.3	17	56
		222

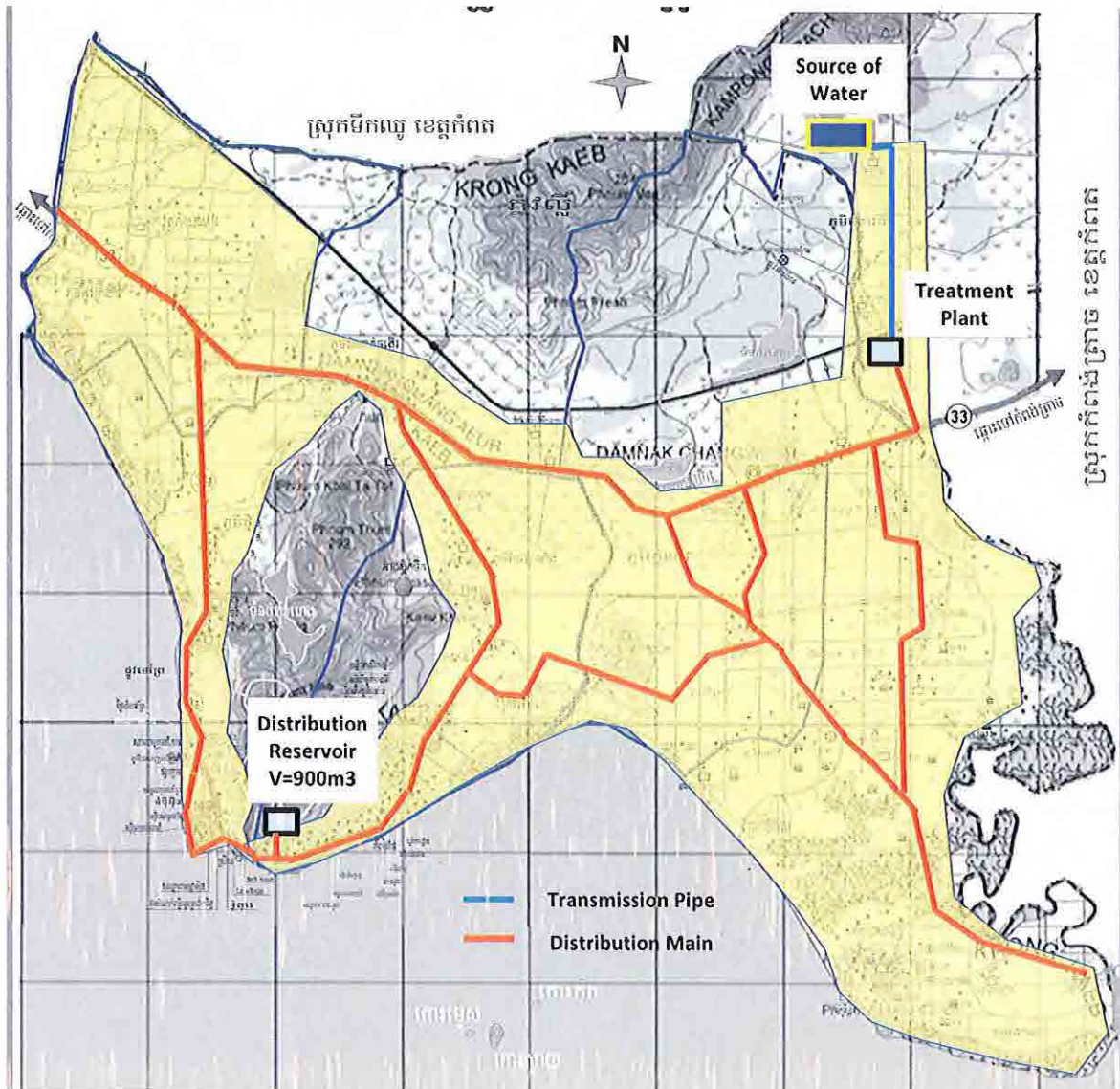
Pipe Data

Pipe Name	Length	Diameter
P1	60	80
P2	1,000	50
P3	1,000	50
Total	2,060	

Service Area of Kep 2030

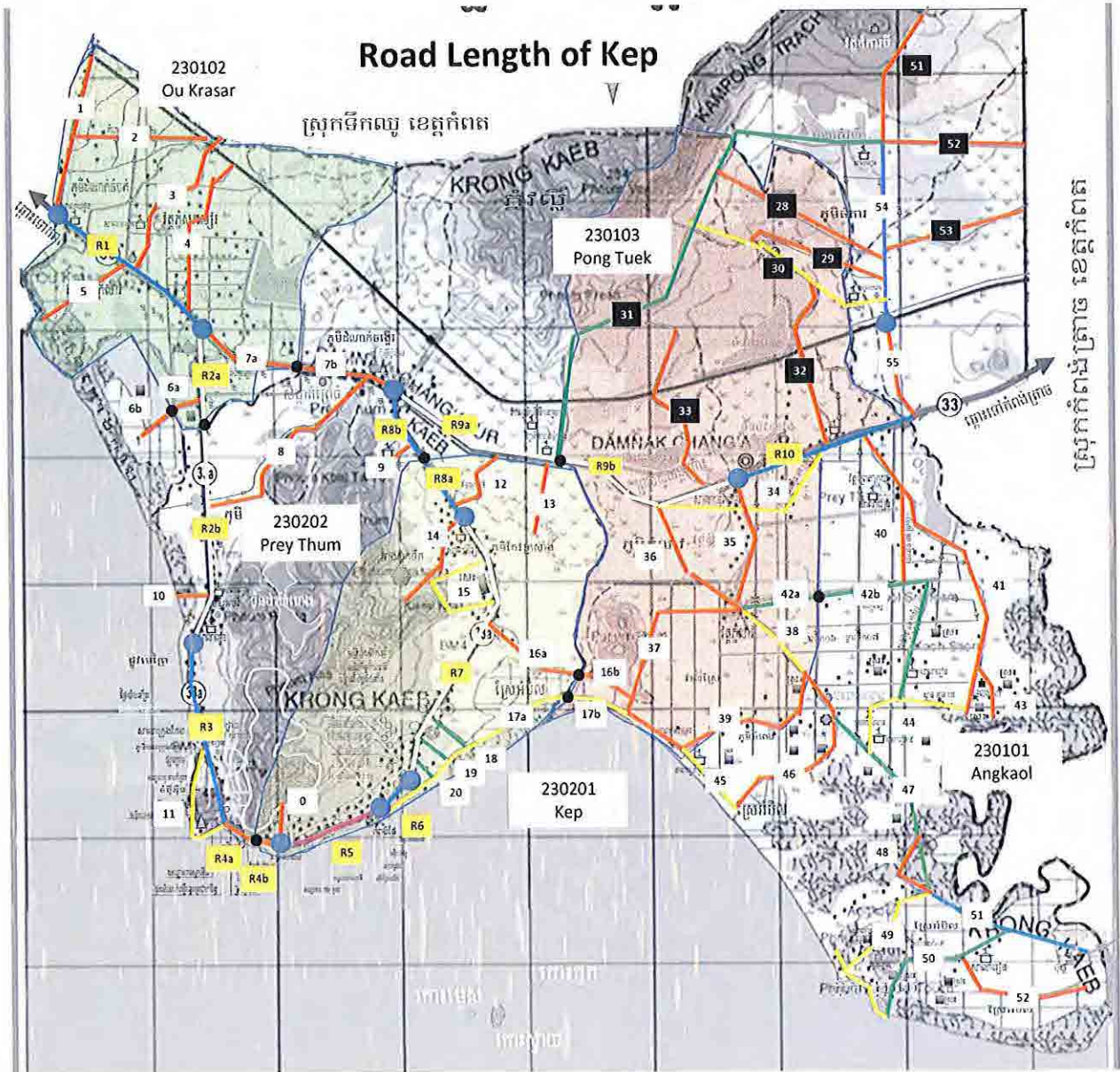


Outline of Water Supply Facilities of Kep 2030



Cost Estimation for the Transmission and Distribution Facilities in Kep 2030 (US\$)

Category	Material	Diameter	Unit	Unit Cost US\$/m	2015		2030		Total
					Length	Cost	Length	Cost	
Main	DCIP	500	m	149.67			5,021		
Main	DCIP	450	m	136.54			4,551		
Main	DCIP	400	m	123.41			4,733		
Main	DCIP	350	m	109.90			3,423		
Main	DCIP	300	m	103.85			1,807		
Main	PE	250	m	68.47	600		13,452		
Main	PE	200	m	48.53	10,490		9,597		
Sub main	PE	150	m	38.54	1,040		14,577		
Sub main	PE	100	m	24.92	4,490		7,819		
Branch	PE	80	m	19.79	1,060		9,967		
Branch	PE	50	m	11.99	3,000		19,053		
Water Reservoir (V=900m3)			set		1				
Booster Pump			set		1				
TOTAL					20,680 m		94,000 m		7,969m3/D



Tabulation of Road Length (Km)

230102 Ou Krasar			
	Total	2015	2030
1	2.60		2.60
2	1.30		1.30
3	2.78		2.78
4	3.34		3.34
5	0.97		0.97
6a	0.51		0.51
7a	1.70		1.70
R1	2.83		2.83
R2a	1.55		1.55
Sub total	17.58	0.00	17.58

230202 Prey Thum			
	Total	2015	2030
6b	0.50		0.50
7b	1.73		1.73
8	3.54		3.54
9	0.38		0.38
10	0.51		0.51
11	2.03	2.03	2.03
R2b	3.61		3.61
R3	2.79		2.79
R4a	0.47	0.47	0.47
R8b	1.17		1.17
R9a	3.01		3.01
Sub total	19.74	2.50	19.74

230201 Kep			
	Total	2015	2030
0	0.59	0.59	0.59
12	1.12		1.12
13	0.80		0.80
14	1.31		1.31
15	1.57		1.57
16a	1.15		1.15
17a	3.00		3.00
18	0.66		0.66
19	0.52		0.52
20	0.35		0.35
R4b	0.57	0.57	0.57
R5	1.77	1.77	1.77
R6	0.69	0.69	0.69
R7	4.45		4.45
R8a	1.20		1.20
Sub total	19.75	3.62	19.75

230103 Pong Tuek			
	Total	2015	2030
16b	0.76		0.76
17b	1.29		1.29
28	2.84		0.00
29	2.72		0.00
30	3.75		0.00
31	8.57		0.00
32	3.04		0.00
33	2.34		0.00
34	2.68		2.68
35	1.76		1.76
36	1.95		1.95
37	4.31		4.31
38	0.73		0.73
39	4.06		4.06
42a	1.54		1.54
51	2.37		0.00
52	2.60		0.00
53	2.00		0.00
54	2.86		2.86
55	1.55		1.55
R9b	3.01		3.01
R10	3.22		3.22
Sub total	59.95	0.00	29.72

230101 Angkaol			
	Total	2015	2030
40	0.52		0.52
41	3.44		3.44
42b	3.59		3.59
43	0.50		0.50
44	1.67		1.67
45	1.85		1.85
46	2.63		2.63
47	3.00		3.00
48	1.77		1.77
49	2.40		2.40
50	2.37		2.37
51	2.70		2.70
52	1.45		1.45
Sub total	27.89	0.00	27.89

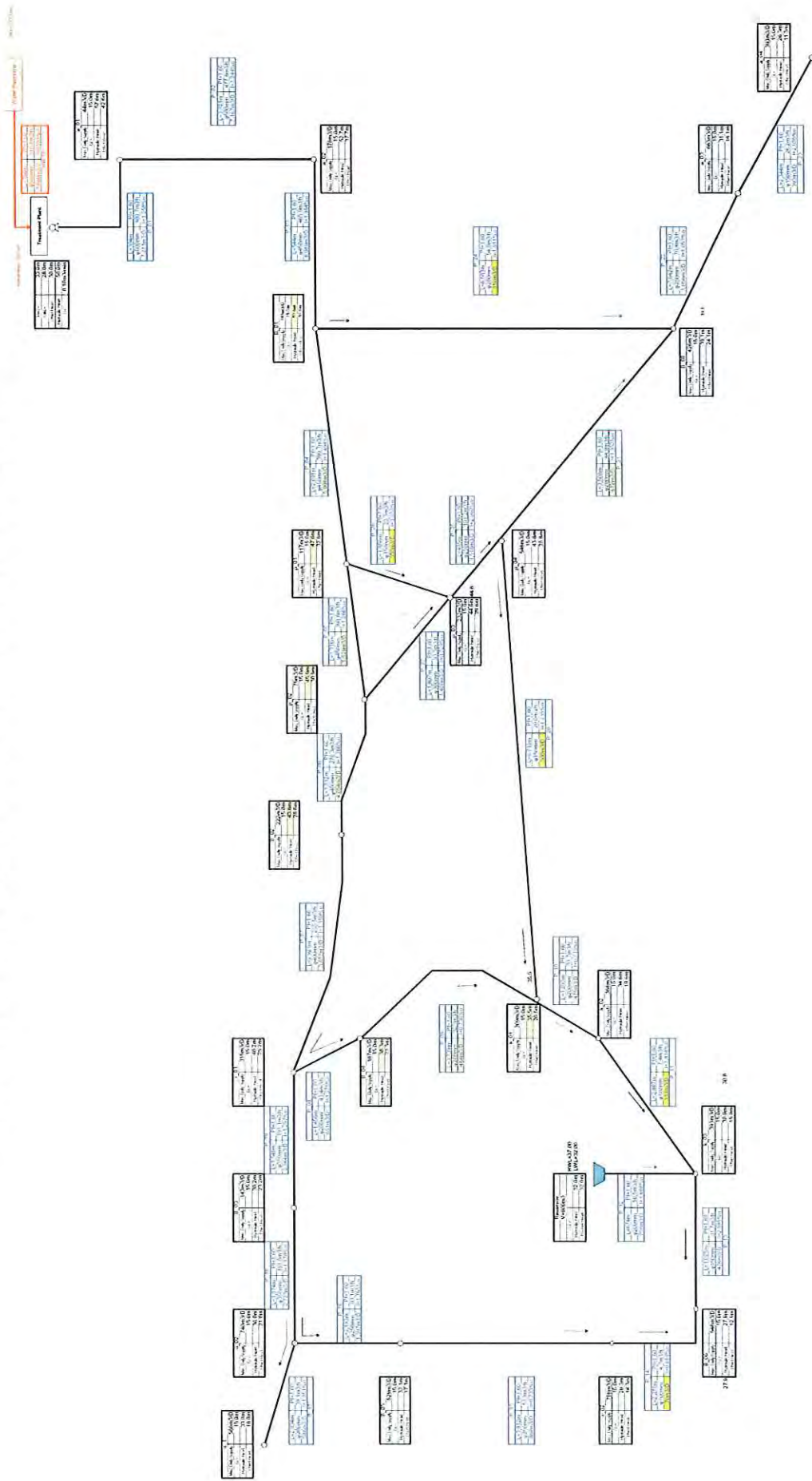
Total	144.91	6.12	114.68
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Hydraulic Calculation in Kep (2030)
Schematic of Nodes



Kitakyushu 31

Results of the Hydraulic Calculation in Kep 2030



Basic Data of the Hydraulic Calculation in Kep 2030

Node Data

Node	Elevation	Max. Daily Supply
TP	32	
a01	32	44
a02	14	178
a03	4	663
a04	4	393
B01	13	183
B02	17	222
B03	9	143
B04	14	167
B05	5	529
B06	16	546
B08	4	426
k01	7	309
k02	13	364
k03	7	393
p01	14	117
p02	10	75
p03	5	232
p04	9	546
o01	5	586
o02	6	740
r01	17	315
r02	16	798
		7,969

Pipe Data

Pipe Name	Length	Diameter
WR-TP	796	500
1	304	500
2	3,921	500
3	544	450
4	2,691	450
5	1,316	450
6	1,812	400
7	2,921	400
8	1,456	200
9	3,739	200
10	1,293	200
11	2,687	100
12	674	200
13	1,025	150
14	2,271	100
15	3,812	250
16	2,193	250
17	2,834	200
18	1,874	350
19	1,549	350
20	6,718	150
21	3,508	200
22	7,642	250
23	2,344	150
24	6,583	200
25	405	250
26	1,856	150
27	1,807	300
Total	70,575	

6.4.

コミュニンリーダーへのインタビュー

(6章+7章)

Surveyor name: In Chanborey

No.: 3

Questionnaire

Date: 2012/01/15

Time: 11.20am -12.00am

Organization/workplace of interviewee: Prey Thum district

Name of Interviewee: Mr. Touch Saman, Director of Prey Thum District

Name of Commune: Prey Thum district

1 Characteristic of Local Condition

Q1. What is the characteristic of this commune? (Industry, Production and Others)

1	60% are doing rice plantation
2	12 %Fishing
3	15% Businessmen
4	11 %work in the factories/labor work ; 7% officers

Q2. How much is the average annual income of the family in this commune's inhabitants /residences?

Average	10,000Riels/Month	Around 40\$ Dollars/year
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2 Individual Conditions regarding Water Use

Q3. Average water sources and purpose to use (check table below)

		Purpose to use					
		Drinking	Cooking	Bathing	Cloth washing	Toilet flushing	Dish washing
Water Source	Rainwater	✓	✓	✓	✓	✓	✓
	Well	✓	✓	✓	✓	✓	✓
	River						
	Bottled water	✓					
	Other (specify)						
	Other (specify)						

Q4. How is average family in this commune treating water before drink or used for cooking?

Well Water	(a) boiling (b) filter (c) no treatment (d) using chemical to treat water (e) others(specify) <u>Use some treatment called 'ABET'</u>
Pond	(a) boiling (b) filter (c) no treatment (d) using chemical to treat water (e) others(specify) <u>Use some treatment called 'ABET'</u>

Q5. What is the average type of well in this community?

(a) private (b) shared by community

Q6. Does every house have own well? Incase of NO, how many households use one well?

1. YES 2. NO (One well per <u>7 - 15</u> households)
--

Q7. Do people in this commune have any treatment facility for well water?

(a) no treatment (b) sand filtration (c) others (specify) <u>Rabbit filter</u>
--

Q8. In case that the answer is (d) using chemical to treat water, what kind of chemical do people use and how much do they pay for the chemical per one month?

Kind of chemical	ABET
Payment	Free KHR/month

Q9. Is average family in this commune using storage tank or any storage facilities in their own house?

1. YES 2. NO

Q10. How large is volume of the storage facility?

5 M ³ – 10M ³

Q11. How long does it take to use up the volume of the storage facility?

3 or 4 days for average family number of <u>4 - 8</u> Person
--

3 Water Usage (Volume)

Q12. Family Number and consuming water volume per person per day

Family Number	4 – 8	Person /Family
Water volume per family per day	240L – 300L	Littre /Family/day
Water volume per person per day	20L	Littre /Person/day

Q13. Do people in this commune have problems about water **volume** that they want to use? And what are those?

Kind of Water Source	Wells and ponds (It's enough during rainy season)
Shortage	Yes during the dry season
Seasonal Fluctuation	During dry season
Price	Usually it costs 1000L = 25,000R but during dry season it costs 1M ³ = 30,000R

4 Water Quality

Q14. Do people in this commune have problems about water **quality** that they want to use? And what are those?

Kind of Water Source	Wells and ponds
Quality	Not good
Safeness/Disease	Ok
Taste	For wells and ponds water cant be drunk during the dry season
Smell	Smelly
Feeling of touch to skin	No problem

Q15. In this commune can you guess **how much percentage of people wants clean safe water** instead of present their using water?

100%

Q16. In wet season do people use roof drainage water (rain water)? If they are **using rainwater in wet season**, how much is the percentage in total use of the season?

Around 70 – 80% of total use of the season

Q17. Do people in this commune have any **complain** against water quality of well water?

(a) no (b) smell (c) color (d) taste (e) others(specify) _____

5 Purchase of Water

Q18. Is average family buying **bottled water and/or clean 20L water container**?

1. YES 2. NO Note: 1. Rich people; 2. Office; 3. Guesthouse

Q19. How much is average family paying per month to buy bottled water and/or clean 20L water container?

Dry season: 3\$ KHR/month/average family

Wet season: 1\$ KHR/month/average family

Q20. Is average family in this commune buying river water?

1. YES 2. NO

Q21. How much is average family in this commune paying per month to buy river water?

Dry season: KHR/month/average family

Wet season: KHR/month/average family

Q22. If people can get clear clean safe water, is average people willing to pay the higher price?

(a) 0.5 US Dollar / m³ (b) 1.0 US Dollar / m³ (c) 1.5 US Dollar / m³

Write any specific characteristics for household surveyed (by surveyor):

Surveyor name: In Chanborey

No.: 2

Questionnaire

Date: 2012/01/15

Time: 10.00am -11.00am

Organization/workplace of interviewee: O-Krosar district

Name of Interviewee: Mr. Koy Jeng Kong, Director of O-Krosar District

Name of Commune: O-Krosar district

1 Characteristic of Local Condition

Q1. What is the characteristic of this commune? (Industry, Production and Others)

1	Most people plant rice 80%
2	20 %Fishing
3	Beside planting season, some go to work in the factories
4	

Q2. How much is the average annual income of the family in this commune's inhabitants /residences?

Average	10,000Riels/Month	Around 40\$ Dollars/year
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2 Individual Conditions regarding Water Use

Q3. Average water sources and purpose to use (check table below)

		Purpose to use					
		Drinking	Cooking	Bathing	Cloth washing	Toilet flushing	Dish washing
Water Source	Rainwater	✓	✓	✓	✓	✓	✓
	Well	✓	✓	✓	✓	✓	✓
	River						
	Bottled water	✓					
	Other (specify)						
	Other (specify)						

Q4. How is average family in this commune treating water before drink or used for cooking?

Well Water	(a) boiling (b) filter (c) no treatment (d) using chemical to treat water (e) others(specify) <u>Use some treatment called 'ABET'</u>
River Water	(a) boiling (b) filter (c) no treatment (d) using chemical to treat water (e) others(specify) _____

Q5. What is the average type of well in this community?

(a) private (b) shared by community

Q6. Does every house have own well? Incase of NO, how many households use one well?

1. <u>YES</u> 2. NO (One well per <u>5</u> households)
--

Q7. Do people in this commune have any treatment facility for well water?

(a) no treatment (b) sand filtration (c) others (specify) <u>Rabbit filter</u>
--

Q8. In case that the answer is (d) using chemical to treat water, what kind of chemical do people use and how much do they pay for the chemical per one month?

Kind of chemical	ABET
Payment	Free KHR/month

Q9. Is average family in this commune using storage tank or any storage facilities in their own house?

1. <u>YES</u> 2. NO

Q10. How large is volume of the storage facility?

Most people use Khmer traditional pot contains water around 100L to 200L
--

Q11. How long does it take to use up the volume of the storage facility?

1 or 2 days for average family number of <u>3 - 4</u> Person
--

3 Water Usage (Volume)

Q12. Family Number and consuming water volume per person per day

Family Number	7 - 8	Person /Family
Water volume per family per day	300L - 400L	Litre /Family/day
Water volume per person per day	20L	Litre /Person/day

Q13. Do people in this commune have problems about water volume that they want to use? And what are those?

Kind of Water Source	Wells and ponds
Shortage	Yes
Seasonal Fluctuation	During dry season
Price	Usually it costs 1000L = 25,000R but during dry season it costs 1M ³ = 30,000R

4 Water Quality

Q14. Do people in this commune have problems about water quality that they want to use? And what are those?

Kind of Water Source	Wells and ponds (During the dry season people buy water 220L = 8,000Riels)
Quality	Ok
Safeness/Disease	Ok
Taste	Ok
Smell	No smell
Feeling of touch to skin	No problem

Q15. In this commune can you guess how much percentage of people wants clean safe water instead of present their using water?

80%

Q16. In wet season do people use roof drainage water (rain water)? If they are using rainwater in wet season, how much is the percentage in total use of the season?

Around 50 % of total use of the season

Q17. Do people in this commune have any complain against water quality of well water?

(a) no (b) smell (c) color (d) taste (e) others(specify) _____

5 Purchase of Water

Q18. Is average family buying bottled water and/or clean 20L water container?

1. YES 2. NO

Q19. How much is average family paying per month to buy bottled water and/or clean 20L water container?

Dry season: 3\$	KHR/month/average family
Wet season: 1\$	KHR/month/average family

Q20. Is average family in this commune buying river water?

1. YES	2. NO
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Q21. How much is average family in this commune paying per month to buy river water?

Dry season:	KHR/month/average family
Wet season:	KHR/month/average family

Q22. If people can get clear clean safe water, is average people willing to pay the higher price?

(a) 0.5 US Dollar / m ³	(b) 1.0 US Dollar / m ³	(c) 1.5 US Dollar / m ³
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Write any specific characteristics for household surveyed (by surveyor):

Surveyor name: In Chanborey

No.: 1

Questionnaire

Date: 2012/01/15 Time: 09.00am -10.00am

Organization/workplace of interviewee: KEP district

Name of Interviewee: Mr. Nop Som Aun, Director of KEP District

Name of Commune: Kep district

1 Characteristic of Local Condition

Q1. What is the characteristic of this commune? (Industry, Production and Others)

1	Most people plant rice 80%
2	Other seasonal crops such as: cucumber, pumpkin, bean, etc.
3	Fishing
4	

Q2. How much is the average annual income of the family in this commune's inhabitants /residences?

Average	50\$-60\$/Month	600\$	Dollars/year
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2 Individual Conditions regarding Water Use

Q3. Average water sources and purpose to use (check table below)

		Purpose to use					
		Drinking	Cooking	Bathing	Cloth washing	Toilet flushing	Dish washing
Water Source	Rainwater				✓	✓	
	Well	✓	✓	✓	✓	✓	✓
	River						
	Bottled water	✓					
	Other (specify)						
	Other (specify)						

Q4. How is average family in this commune treating water before drink or used for cooking?

Well Water	(a) boiling (b) filter (c) no treatment (d) using chemical to treat water (e) others(specify) <u>Use some treatment called 'ABET'</u>
River Water	(a) boiling (b) filter (c) no treatment (d) using chemical to treat water (e) others(specify) _____

Q5. What is the average type of well in this community?

(a) private (b) shared by community

Q6. Does every house have own well? Incase of NO, how many households use one well?

1. <u>YES</u> 2. NO (One well per <u>5</u> households)
--

Q7. Do people in this commune have any treatment facility for well water?

(a) no treatment (b) sand filtration (c) others (specify) <u>Rabbit filter</u>
--

Q8. In case that the answer is (d) using chemical to treat water, what kind of chemical do people use and how much do they pay for the chemical per one month?

Kind of chemical	ABET
Payment	Free KHR/month

Q9. Is average family in this commune using storage tank or any storage facilities in their own house?

1. <u>YES</u> 2. NO

Q10. How large is volume of the storage facility?

Around 1 m ³ But some just have only 200L – 500L

Q11. How long does it take to use up the volume of the storage facility?

2 or 3 days for average family number of <u>4 - 6</u> Person
--

3 Water Usage (Volume)

Q12. Family Number and consuming water volume per person per day

Family Number	4 – 6	Person /Family
Water volume per family per day	100L – 200L	Litre /Family/day
Water volume per person per day	20L	Litre /Person/day

Q13. Do people in this commune have problems about water volume that they want to use? And what are those?

Kind of Water Source	Wells and ponds
Shortage	Yes
Seasonal Fluctuation	During dry season
Price	Usually it costs 1000L = 25,000R but during dry season it costs 1M ³ = 30,000R

4 Water Quality

Q14. Do people in this commune have problems about water quality that they want to use? And what are those?

Kind of Water Source	Wells and ponds
Quality	Ok
Safeness/Disease	Ok
Taste	Ok
Smell	No smell
Feeling of touch to skin	No problem

Q15. In this commune can you guess how much percentage of people wants clean safe water instead of present their using water?

100%

Q16. In wet season do people use roof drainage water (rain water)? If they are using rainwater in wet season, how much is the percentage in total use of the season?

Around 20 % of total use of the season

Q17. Do people in this commune have any complain against water quality of well water?

(a) no (b) smell (c) color (d) taste (e) others(specify) No

5 Purchase of Water

Q18. Is average family buying bottled water and/or clean 20L water container?

1. YES 2. NO

Q19. How much is average family paying per month to buy bottled water and/or clean 20L water container?

Dry season: 4\$	KHR/month/average family
Wet season: 1\$	KHR/month/average family

Q20. Is average family in this commune buying river water?

1. YES	2. <u>NO</u>
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Q21. How much is average family in this commune paying per month to buy river water?

Dry season:	KHR/month/average family
Wet season:	KHR/month/average family

Q22. If people can get clear clean safe water, is average people willing to pay the higher price?

(a) 0.5 US Dollar / m ³	(b) 1.0 US Dollar / m ³	(c) <u>1.5 US Dollar / m³</u>
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Write any specific characteristics for household surveyed (by surveyor):
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Surveyor name: SARAN Sopha

No.: _____

Questionnaire

Date: 17 January 2012

Time: 8.30AM – 9.05AM

Organization/workplace of interviewee: Trapaing Thom Commune

Name of Interviewee: YAV Soern, Commune Leader

Name of Commune Trapaing Thom

Note: 'N/A' means the answers is not needed thus can be skipped.

1 Characteristic of Local Condition

Q1. What is the characteristic of this commune? (Industry, Production and Others)

1	Agriculture – 600 families live mainly on agriculture.
2	Some families have small private business in the city market.
3	
4	

Q2. How much is the average annual income of the family in this commune's inhabitants /residences?

Average	Dollars/year
It is difficult to estimate the annual income, as most villagers would not want to reveal their actual income.	

2 Individual Conditions regarding Water Use

Q3. Average water sources and purpose to use (check table below)

		Purpose to use					
		Drinking	Cooking	Bathing	Cloth washing	Toilet flushing	Dish washing
Water Source	Rainwater	✓	✓	✓	✓	✓	✓
	Well			✓	✓	✓	✓
	Pond			✓	✓	✓	✓
	Bottled water						

Kampot Water Supply	✓	✓	✓	✓	✓	✓
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- Well water is mainly used for washing clothe and feeding animals because its quality is not good.
- There are 4 villages in Trapaing Thom Commune: Kraing, Trapaing Thom, Svay Thom and Trapaing Chrey.
- Kraing and Trapaing Thom already have access to Kampot Water Supply → Water is adequate.
- The other two villages still haven't got the access yet. The main sources of water in these two villages are pumping wells and ponds. In general, the water in this commune is adequate. But in case there is shortage in dry season, the villagers can just buy water from the other two villages which have access to Kampot Water Supply.
- The price of water bought from acquaintances is 200L = 2000R → 1m3 = 10000R.

Q4. How is average family in this commune treating water before drink or used for cooking?

Well Water	<input checked="" type="radio"/> (a) boiling (b) filter (c) no treatment (d) using chemical to treat water (e) others(specify)_____
River Water	<input checked="" type="radio"/> (a) boiling (b) filter (c) no treatment (d) using chemical to treat water (e) others(specify)_____

Q5. What is the average type of well in this community?

<input checked="" type="radio"/> (a) private (b) shared by community
--

Q6. Does every house have own well? In case of NO, how many households use one well?

<input checked="" type="radio"/> 1. YES 2. NO (One well per _____ households)

Q7. Do people in this commune have any treatment facility for well water? N/A

(a) no treatment (b) sand filtration (c) others (specify)_____
--

Q8. In case that the answer is (d) using chemical to treat water, what kind of chemical do people use and how much do they pay for the chemical per one month? N/A

Kind of chemical	
Payment	KHR/month

Q9. Is average family in this commune using storage tank or any storage facilities in their own house?

N/A

1. YES	2. NO
--------	-------

Q10. How large is volume of the storage facility? N/A

m ³

Q11. How long does it take to use up the volume of the storage facility? N/A

days for average family number of _____ Person
--

3 Water Usage (Volume)

Q12. Family Number and consuming water volume per person per day

Family Number	3	Person /Family
Water volume per family per day	90L	Litre /Family/day
Water volume per person per day	30L	Litre /Person/day

Q13. Do people in this commune have problems about water volume that they want to use? And what are those? N/A

Kind of Water Source	
Shortage	
Seasonal Fluctuation	
Price	

4 Water Quality

Q14. Do people in this commune have problems about water quality that they want to use? And what are those? N/A

Kind of Water Source	
Quality	
Safeness/Disease	
Taste	
Smell	
Feeling of touch to skin	

Q15. In this commune can you guess how much percentage of people wants clean safe water instead of present their using water? N/A

%

Q16. In wet season do people use roof drainage water (rain water)? If they are using rainwater in wet season, how much is the percentage in total use of the season? N/A

% of total use of the season

Q17. Do people in this commune have any complain against water quality of well water? N/A

(a) no (b) smell (c) color (d) taste (e) others(specify) _____
--

5 Purchase of Water

Q18. Is average family buying bottled water and/or clean 20L water container?

1. YES <input checked="" type="radio"/> 2. NO

BUT for people in Svay Thom and Trapaing Chrey villages, they buy water from the other two village in dry season. The volume of water is 200L = 2000R.

Q19. How much is average family paying per month to buy bottled water and/or clean 20L water container? N/A

Dry season:	KHR/month/average family
Wet season:	KHR/month/average family

Q20. Is average family in this commune buying river water? N/A

1. YES 2. NO

Q21. How much is average family in this commune paying per month to buy river water? N/A

Dry season:	KHR/month/average family
Wet season:	KHR/month/average family

Q22. If people can get clear clean safe water, is average people willing to pay the higher price?

(a) 0.5 US Dollar / m ³ (b) 1.0 US Dollar / m ³ <input checked="" type="radio"/> (c) 1.5 US Dollar / m ³

HOWEVER, the cheaper the price is, the better!!

Write any specific characteristics for household surveyed (by surveyor):

The Commune seems to be developing well. This may be due to the adequate access to water. Also, people in this commune seem to be hard working and thrifty. (they try to use as little water as they can in dry season, in order to avoid spending too much on buying water.)

Surveyor name: SARAN Sopha

No.: _____

Questionnaire

Date: 17 January 2012

Time: 9.30AM – 10.20AM

Organization/workplace of interviewee: Prey Khmom Commune Office

Name of Interviewee: SAO Meng, Prey Khmom Commune Leader

Name of Commune Prey Khmom

Note: 'N/A' means the answers is not needed thus can be skipped.

1 Characteristic of Local Condition

Q1. What is the characteristic of this commune? (Industry, Production and Others)

1	95% of people are farmers. However, there is only one crop production which is "rice". We cannot grow any other crops because there is not enough water supply.
2	Apart from being farmers, some people also work part-time as labor workers (construction workers, etc.)
3	Production of Sugar Palm is also one main income source.
4	

Q2. How much is the average annual income of the family in this commune's inhabitants /residences?

Average	500 – 600USD	Dollars/year
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2 Individual Conditions regarding Water Use

Q3. Average water sources and purpose to use (check table below)

		Purpose to use					
		Drinking	Cooking	Bathing	Cloth washing	Toilet flushing	Dish washing
Water Source	Rainwater	✓	✓				
	Well			✓	✓	✓	✓
	Pond			✓	✓	✓	✓
	Bottled water						

Other (specify)							
Other (specify)							

- There are 4 villages in this commune: Wat Ang, Prey Khmom, Prey Tom, Boeung Taroeung.
- The commune doesn't have access to Kampot Water Supply.
- For Wat Ang, Prey Khmom and Prey Tom villages, the main water sources are from rain, wells and ponds. But for Boeung Taroeung, the villagers have to buy water from the private water vendors the whole year, because underground water is too salty.
- Rainwater is the best water source, but it's not enough, especially in dry season.

Q4. How is average family in this commune treating water before drink or used for cooking?

Well Water	<input checked="" type="radio"/> (a) boiling (b) filter (c) no treatment (d) using chemical to treat water (e) others(specify)_____
Pond Water	<input checked="" type="radio"/> (a) boiling (b) filter (c) no treatment (d) using chemical to treat water (e) others(specify)_____

BUT only about 20% of people boil water before drinking.

Q5. What is the average type of well in this community?

(a) private (b) shared by community

- 3 wells are private. 3 wells are shared by community.
- All ponds are shared by community.
- In Wat Ang Village, there are 2 ponds and 3 wells.
- In Prey Khmom Village, there are 6 ponds and NO well.
- In Prey Tom Village, there are 3 ponds and NO well.

Q6. Does every house have own well? Incase of NO, how many households use one well? N/A

1. YES 2. NO (One well per _____ households)
--

Q7. Do people in this commune have any treatment facility for well water? N/A

(a) no treatment (b) sand filtration (c) others (specify)_____
--

Q8. In case that the answer is (d) using chemical to treat water, what kind of chemical do people use and how much do they pay for the chemical per one month? N/A

Kind of chemical	
Payment	KHR/month

Q9. Is average family in this commune using storage tank or any storage facilities in their own house?

N/A

1. YES	2. NO
--------	-------

Q10. How large is volume of the storage facility? N/A

m ³

Q11. How long does it take to use up the volume of the storage facility? N/A

days for average family number of _____ Person
--

3 Water Usage (Volume)

Q12. Family Number and consuming water volume per person per day

Family Number	3 - 5	Person /Family
Water volume per family per day	300L	Litre /Family/day
Water volume per person per day	50L	Litre /Person/day

Price of water bought from acquaintance is 30L = 250R.

Q13. Do people in this commune have problems about water volume that they want to use? And what are those? N/A

Kind of Water Source	
Shortage	
Seasonal Fluctuation	
Price	

4 Water Quality

Q14. Do people in this commune have problems about water quality that they want to use? And what are those?

Kind of Water Source	Rain Water	Well	Pond
Quality	Good	According to the locations. But in general, the water is not so clear.	Same as well water
Safeness/Disease	No	Not sure	
Taste	Good	o.k.	
Smell	No	No	
Feeling of touch to skin	No	No	

Q15. In this commune can you guess how much percentage of people wants clean safe water instead of present their using water?

100 %

Q16. In wet season do people use roof drainage water (rain water)? If they are using rainwater in wet season, how much is the percentage in total use of the season?

Around 20% of total use of the season

Q17. Do people in this commune have any complain against water quality of well water? N/A

(a) no (b) smell (c) color (d) taste (e) others(specify)_____

5 Purchase of Water

Q18. Is average family buying bottled water and/or clean 20L water container?

1. YES 2. NO

But not many people buy the bottled water because it is too expensive. Only around 5% of people buy the water; mainly to use in special occasions as wedding.

Q19. How much is average family paying per month to buy bottled water and/or clean 20L water container?

Dry season: around 40000R KHR/month/average family

Wet season: maybe a bit less than in dry season KHR/month/average family

Q20. Is average family in this commune buying river water? N/A

1. YES 2. NO

Q21. How much is average family in this commune paying per month to buy river water? N/A

Dry season: KHR/month/average family

Wet season: KHR/month/average family

Q22. If people can get clear clean safe water, is average people willing to pay the higher price?

(a) 0.5 US Dollar / m³ (b) 1.0 US Dollar / m³ (c) 1.5 US Dollar / m³

Write any specific characteristics for household surveyed (by surveyor):

- Most villagers will be willing to buy water at the price of $1\text{ m}^3 = 1.5\text{USD}$ because the commune really lacks of water supply.
- People in this commune are hard working. They try to work part-time in order to increase the living standard of their families.

Surveyor name: SARAN Sopha

No.: _____

Questionnaire

Date: 17 January 2012 Time: 10.35AM – 11.10AM

Organization/workplace of interviewee: Thmei Commune Office

Name of Interviewee: HOM Chhoy, Commune Leader

Name of Commune Thmei Commune

Note: 'N/A' means the answers is not needed thus can be skipped.

1 Characteristic of Local Condition

Q1. What is the characteristic of this commune? (Industry, Production and Others)

1	100% of populations are farmers. Main productions are 'rice' and 'sugar palm'
2	
3	
4	

Q2. How much is the average annual income of the family in this commune's inhabitants /residences?

Average	300\$	Dollars/year
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2 Individual Conditions regarding Water Use

Q3. Average water sources and purpose to use (check table below)

		Purpose to use					
		Drinking	Cooking	Bathing	Cloth washing	Toilet flushing	Dish washing
Water Source	Rainwater	✓	✓				
	Well	✓	✓	✓	✓	✓	✓
	Pond	✓	✓	✓	✓	✓	✓
	Bottled water						
	Other (specify)						
	Other (specify)						

- Some wells are not good, so the water can only be used for bathing, washing cloth, flushing toilet, washing dish and feeding animals.
- There are 6 villages in this commune. And each village has its own wells.
- Also, there are around 3 - 6 ponds in each village.

Q4. How is average family in this commune treating water before drink or used for cooking?

Well Water	<input checked="" type="radio"/> (a) boiling (b) filter (c) no treatment (d) using chemical to treat water (e) others(specify) _____
Pond Water	<input checked="" type="radio"/> (a) boiling (b) filter (c) no treatment (d) using chemical to treat water (e) others(specify) _____

Q5. What is the average type of well in this community?

(a) private <input type="radio"/> (b) <input checked="" type="radio"/> shared by community
--

Q6. Does every house have own well? Incase of NO, how many households use one well?

1. YES <input type="radio"/> 2. <input checked="" type="radio"/> NO (One well per _____ households)

Q7. Do people in this commune have any treatment facility for well water? N/A

(a) no treatment (b) sand filtration (c) others (specify) _____

Q8. In case that the answer is (d) using chemical to treat water, what kind of chemical do people use and how much do they pay for the chemical per one month? N/A

Kind of chemical	
Payment	KHR/month

Q9. Is average family in this commune using storage tank or any storage facilities in their own house?

<input checked="" type="radio"/> 1. YES <input type="radio"/> 2. NO BUT only around 10% have storage tank
--

Q10. How large is volume of the storage facility?

NOT SURE m^3 → If they are rich, they can afford up to around 10 jars.

Q11. How long does it take to use up the volume of the storage facility? N/A

days for average family number of _____ Person

3 Water Usage (Volume)

Q12. Family Number and consuming water volume per person per day

Family Number	3 - 5	Person /Family
Water volume per family per day	300L	Litre /Family/day
Water volume per person per day	Around 60	Litre /Person/day

Q13. Do people in this commune have problems about water volume that they want to use? And what are those?

Kind of Water Source	Rain Water	Well	Pond
Shortage	No	No	No
Seasonal Fluctuation	In dry season, we can use wells and ponds.	Enough	Enough
Price	X	X	X

4 Water Quality

Q14. Do people in this commune have problems about water quality that they want to use? And what are those?

Kind of Water Source	Rain Water	Well	Pond
Quality	Good	According to the locations. But in general, the water is o.k.	Same as the well water
Safeness/Disease	No	Not sure	
Taste	Good	o.k.	
Smell	No	No	
Feeling of touch to skin	No	No	

Q15. In this commune can you guess how much percentage of people wants clean safe water instead of present their using water?

90 %

Q16. In wet season do people use roof drainage water (rain water)? If they are using rainwater in wet season, how much is the percentage in total use of the season?

90 % of total use of the season

Q17. Do people in this commune have any complain against water quality of well water? N/A

(a) no (b) smell (c) color (d) taste (e) others(specify)_____

5 Purchase of Water

Q18. Is average family buying bottled water and/or clean 20L water container? N/A

1. YES 2. NO

Q19. How much is average family paying per month to buy bottled water and/or clean 20L water container? N/A

Dry season:	KHR/month/average family
Wet season:	KHR/month/average family

Q20. Is average family in this commune buying river water? N/A

1. YES 2. NO

Q21. How much is average family in this commune paying per month to buy river water? N/A

Dry season:	KHR/month/average family
Wet season:	KHR/month/average family

Q22. If people can get clear clean safe water, is average people willing to pay the higher price?

(a) 0.5 US Dollar / m³ (b) 1.0 US Dollar / m³ (c) 1.5 US Dollar / m³

→ Around 50% of the populations might be willing to pay. The rest might still be concerned about the price, so since they have enough water to use. I don't need to buy water.

Write any specific characteristics for household surveyed (by surveyor):

- Standard of living of the villagers is good.
- In overall, there is no serious shortage of water.

Surveyor name: SARAN Sopha

No.: _____

Questionnaire

Date: 17 January 2012

Time: 11.40AM – 12.30AM

Organization/workplace of interviewee: Kompong Samroing Commune Office

Name of Interviewee: CHEAV Neang, Commune Leader

Name of Commune Kompong Samroing Commune

Note: 'N/A' means the answers is not needed thus can be skipped.

1 Characteristic of Local Condition

Q1. What is the characteristic of this commune? (Industry, Production and Others)

1	80% of the population lives on agriculture. The only 2 productions are 'rice' and 'sugar palm'. Other crops cannot grow because the land contains too much salt and the water is not enough.
2	Around 3% work as construction workers when they are free from the farming.
3	Around 1% do finishing and producing salt.
4	

Q2. How much is the average annual income of the family in this commune's inhabitants /residences?

Average	200USD	Dollars/year
---------	--------	--------------

2 Individual Conditions regarding Water Use

Q3. Average water sources and purpose to use (check table below)

		Purpose to use					
		Drinking	Cooking	Bathing	Cloth washing	Toilet flushing	Dish washing
Water Source	Rainwater	✓	✓				
	Well	✓	✓	✓	✓	✓	✓
	Pond	✓	✓	✓	✓	✓	✓
	Bottled water						
	Other (specify)						

Other (specify)							
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- In dry season, people have to buy drinking water.
- Water is bought from the private water vendors (acquaintances who have access to Kampot Water Supply) in a quite expensive price.
 - 1 container = 30L = 500R (self delivery)
 - 1 container = 30L = 1000R (delivery)
- For one month, they would buy at least 10 containers. (JUST FOR DRINKING)
- For those who are rich, they can afford lots of storage tanks and therefore can store some water from the rain in rainy season.

Q4. How is average family in this commune treating water before drink or used for cooking?

Well Water	<input checked="" type="radio"/> (a) boiling (b) filter (c) no treatment (d) using chemical to treat water (e) others(specify) _____
Pond Water	<input checked="" type="radio"/> (a) boiling (b) filter (c) no treatment (d) using chemical to treat water (e) others(specify) _____

BUT not around 50% who boil water before drinking, because mainly they only drink 'rain water' and 'water bought from the vendors'.

Q5. What is the average type of well in this community?

<input checked="" type="radio"/> (a) private (b) shared by community
<ul style="list-style-type: none"> • There are 2 shared ponds in the North Kompong Samroing Pagoda. • And there are 3 shared ponds in the South Kompong Samroing Pagoda.

Q6. Does every house have own well? In case of NO, how many households use one well?

<input checked="" type="radio"/> 1. YES 2. NO (One well per _____ households)

Q7. Do people in this commune have any treatment facility for well water? N/A

(a) no treatment (b) sand filtration (c) others (specify) _____

Q8. In case that the answer is (d) using chemical to treat water, what kind of chemical do people use and how much do they pay for the chemical per one month? N/A

Kind of chemical	
------------------	--

Payment	KHR/month
---------	-----------

Q9. Is average family in this commune using storage tank or any storage facilities in their own house?

<input checked="" type="radio"/> 1. YES <input type="radio"/> 2. NO The number of storage varies in accordance with the standard of the family.
--

Q10. How large is volume of the storage facility?

NOT SURE -- Depends on the size of the storage m ³
--

Q11. How long does it take to use up the volume of the storage facility? N/A

days for average family number of _____ Person
--

3 Water Usage (Volume)

Q12. Family Number and consuming water volume per person per day

Family Number	3 - 6	Person /Family
Water volume per family per day	300L	Litre /Family/day
Water volume per person per day	50L	Litre /Person/day

Q13. Do people in this commune have problems about water volume that they want to use? And what are those?

Kind of Water Source	Rain	Well	Pond
Shortage	Yes – depends on the size of the storage	No	No
Seasonal Fluctuation	Yes	No	No
Price	X	X	X

4 Water Quality

Q14. Do people in this commune have problems about water quality that they want to use? And what are those?

Kind of Water Source	Rain	Well	Pond
Quality	Good	O.K.	O.K.
Safeness/Disease	No	No	No
Taste	Good	O.K.	O.K.
Smell	No	No	No

Feeling of touch to skin	No	No	No
--------------------------	----	----	----

Q15. In this commune can you guess how much percentage of people wants clean safe water instead of present their using water?

80 %

Q16. In wet season do people use roof drainage water (rain water)? If they are using rainwater in wet season, how much is the percentage in total use of the season?

50 % of total use of the season

Q17. Do people in this commune have any complain against water quality of well water?

(a) no (b) smell (c) color (d) taste (e) others(specify) _____

Some people complaint about the Chlorine smell contained in the bought water.

5 Purchase of Water

Q18. Is average family buying bottled water and/or clean 20L water container?

1. YES 2. NO

Q19. How much is average family paying per month to buy bottled water and/or clean 20L water container? N/A

Dry season:	KHR/month/average family
Wet season:	KHR/month/average family

Q20. Is average family in this commune buying river water? N/A

1. YES 2. NO

Q21. How much is average family in this commune paying per month to buy river water? N/A

Dry season:	KHR/month/average family
Wet season:	KHR/month/average family

Q22. If people can get clear clean safe water, is average people willing to pay the higher price?

(a) 0.5 US Dollar / m³ (b) 1.0 US Dollar / m³ (c) 1.5 US Dollar / m³

→ I guess maybe 100% will be willing to pay at that price, because if compared to the amount they currently spend for water, the price is still a lot cheaper.

Write any specific characteristics for household surveyed (by surveyor):

- The shortage of water is one of the most concerning issues of the commune.
- This shortage can be a cause of low standard of living of the populations as well.

6.5.

ケップ民営水道ライセンス延長許可証



ព្រះរាជាណាចក្រកម្ពុជា

ជាតិ សាសនា ព្រះមហាក្សត្រ

**Kingdom of Cambodia
Nation Religion King**

ក្រសួងឧស្សាហកម្ម រ៉ែ និងថាមពល

Ministry of Industry, Mines and Energy

លេខ : ២០១០.០៦.១៧១៧

រាជធានីភ្នំពេញ ថ្ងៃទី ២៤ ខែ ធ្នូ ឆ្នាំ ២០១១

**រដ្ឋមន្ត្រីក្រសួងឧស្សាហកម្ម រ៉ែ និងថាមពល
ជំរាបជូន**

លោកប្រធានក្រុមហ៊ុន ចេសចិន ខុសស្តួល ឌីវេឡុបមេន

កម្មវត្ថុ: ករណីដំណើរការអភិវឌ្ឍន៍ទឹកស្អាតនៅភូមិថ្មី សង្កាត់ព្រៃធំ ក្រុងកែប ខេត្តកែប។

- យោង:** - ប្រកាសលេខ ៥៨៥ ឧរថ.ទស.ប្រក ចុះថ្ងៃទី ០៧ ខែកក្កដា ឆ្នាំ ២០០៨ របស់ក្រសួងឧស្សាហកម្ម រ៉ែ និងថាមពល។
- កំណត់ហេតុ ចុះថ្ងៃទី ១៤ ខែ តុលា ឆ្នាំ ២០១១ របស់ក្រសួងឧស្សាហកម្ម រ៉ែ និងថាមពល ស្តីពីការប្រជុំពិភាក្សាអំពីដំណើរការអភិវឌ្ឍន៍ទឹកស្អាតនៅខេត្តកែប។

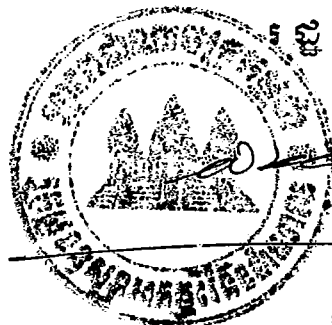
សេចក្តីដូចបានចែងក្នុងកម្មវត្ថុ និងយោងខាងលើ ខ្ញុំសូមជំរាបលោកប្រធានក្រុមហ៊ុនជ្រាបថា យោងតាមលទ្ធផលការងារអភិវឌ្ឍន៍ទឹកស្អាតនៅខេត្តកែបបានមួយចំនួន និងមូលហេតុដែលមិនបានអនុវត្តក្នុងការដំណើរការបានតាមកាលកំណត់នៃសេចក្តីប្រកាស ព្រមទាំងសំណូមពរសុំអនុញ្ញាតធ្វើការអភិវឌ្ឍន៍ទឹកស្អាតបន្តទៀតនោះ ដោយឈរលើគោលការណ៍ទទួលខុសត្រូវខ្ពស់ ដែលលោកប្រធានបានលើកឡើងក្នុងអង្គប្រជុំនៅថ្ងៃទី ១៤ ខែ តុលា ឆ្នាំ ២០១១។ មូលហេតុនេះ ក្រសួងឧស្សាហកម្ម រ៉ែ និងថាមពល អនុញ្ញាតឲ្យក្រុមហ៊ុនរបស់លោកបន្តដំណើរការអភិវឌ្ឍន៍ចំនួន ៦ ខែ ទៀតចាប់ពីថ្ងៃជូនដំណឹងនេះ ក្នុងករណីដែលការអនុវត្តដំណើរការមិនបានសកម្មទេនោះ ក្រសួងនឹងដកហូតប្រកាសអនុញ្ញាតឲ្យធ្វើអាជីវកម្មទឹកស្អាតនៅតំបន់នេះជាស្វ័យប្រវត្តិ។

អាស្រ័យដូចបានជំរាបជូនខាងលើ ក្រសួងសូមលោកប្រធានក្រុមហ៊ុនជ្រាប និងអនុវត្តឲ្យមានប្រសិទ្ធភាពកុំបីខាន។

សូមលោកប្រធានទទួលនូវការរាប់អានដ៏ជ្រាលជ្រៅអំពីខ្ញុំ ។

ចំលងជូន

- សាលាខេត្តកែប
- មន្ទីរឧស្សាហកម្ម រ៉ែ និងថាមពលខេត្តកែប
- ឯកសារ-កាលប្បវត្តិ



រដ្ឋមន្ត្រី
[Signature]
ស៊ុយ តែសេម

**Kingdom of Cambodia
Nation Religion King**

**Ministry of Industry, Mines and Energy
No. 2306 MIME**

Phnom Penh, 29 November 2011

Minister of Industry, Mines and Energy

To

Director of Western Coastal Development Co., Ltd

Subject: The Process of Portable Water Development in Thmei Village, Prey Thom Commune, Kep City, Kep Province

References:

- Prakas No. 585 issued by MIME on 7 July 2008
- Report issued by MIME on 14 October 2011 on the discussion over the development of portable water in Kep Province.

I would like to inform Mr. Director that according to the result of potable water development in Kep province, and the reason for not being able to start the development as stated in the Prakas as well as the request to suspend this development with strong responsibility and commitment as expressed in the meeting on 14 October 2011, MIME agrees to extend permission to the company to continue the development for another 6 months, valid from the date this note is issued. In case the process is still inactive, MIME will automatically invalidate the license.

In accordance with the above-mentioned reasons, MIME hopes the Director is well-informed and will continue the development effectively.

With my best regards,
Minister
Suy Sem

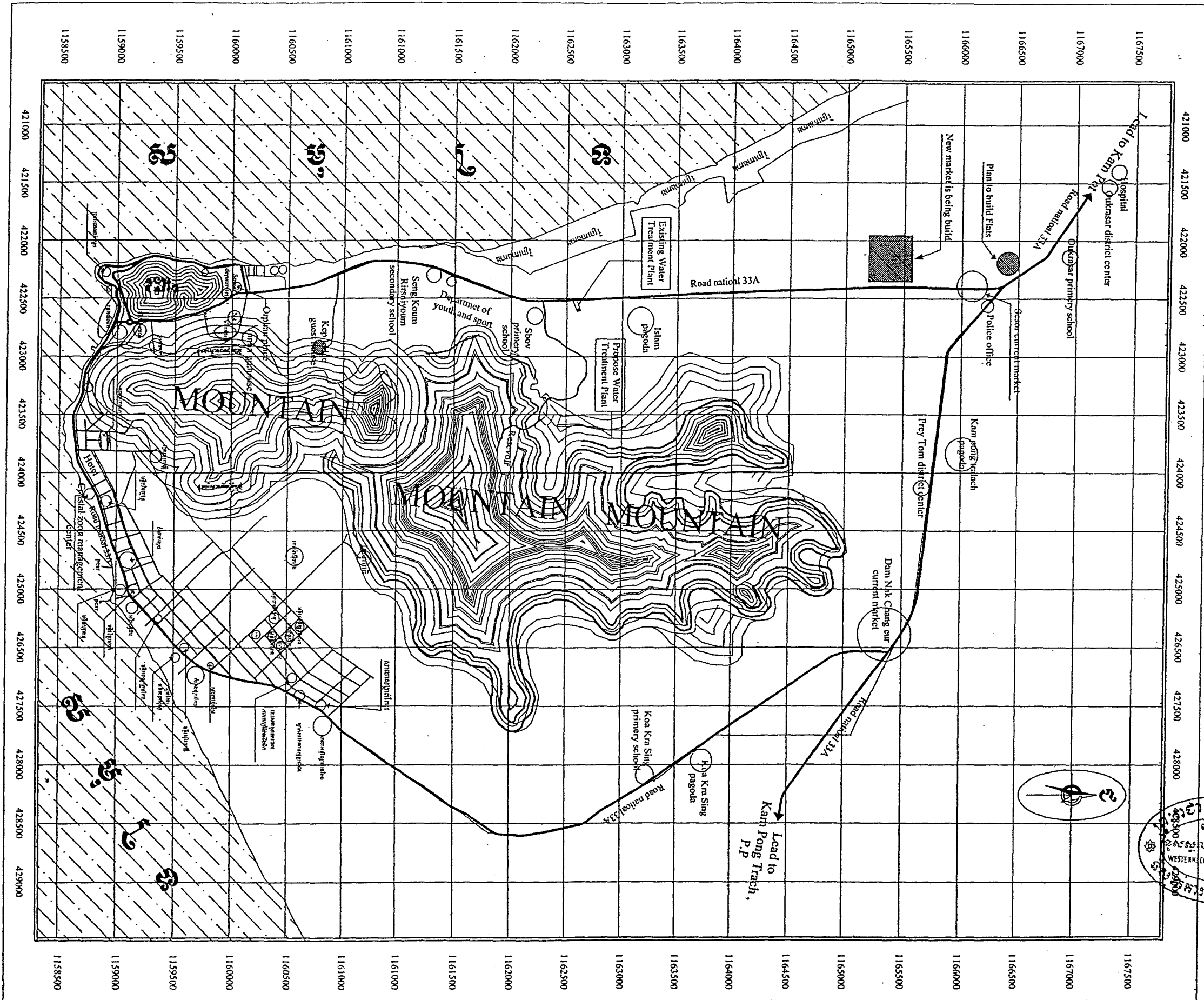
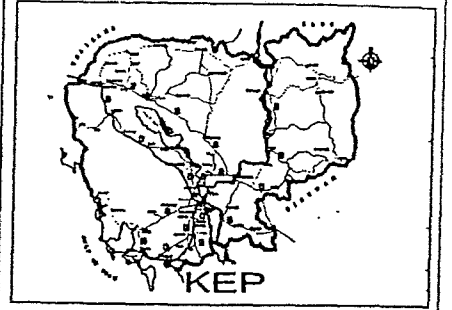
Copies sent to:

- Kep Provincial Office
- Department of Industry, Mines and Energy
- Document-Report

6.6.

ケップ民営水道の

ダム設計資料



REV	DATE	APP'D
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KINGDOM OF CAMBODIA
 Ministry of Industry, Mines and Energy
 #45, Norodom Blvd, Khan Daun Penh,
 Phnom Penh, Cambodia

KINGDOM OF CAMBODIA
 WESTERN COASTAL DEVELOPMENT CO., LTD.
 HOUSE NO. 21, STREET 9, SANGKAT TOLE BASAK,
 KHAN CHANCAR MOON, PHNOM PENH
 TEL: 855-16-837 070. E-MAIL: PHANORN.2006@YAHOO.COM



PROJECT TITLE:
**WATER SUPPLY SYSTEM PROJECT
 IN KEP CITY**

DRAWING TITLE: Vicinity Plan		
DESIGNED BY:	CHECKED BY:	
DRAWN BY:	APPROVED BY:	
SCALE: 1:3300		
DATE:	DWG No: K-C	SHEET No: C3 OF LL

Les dimensions:

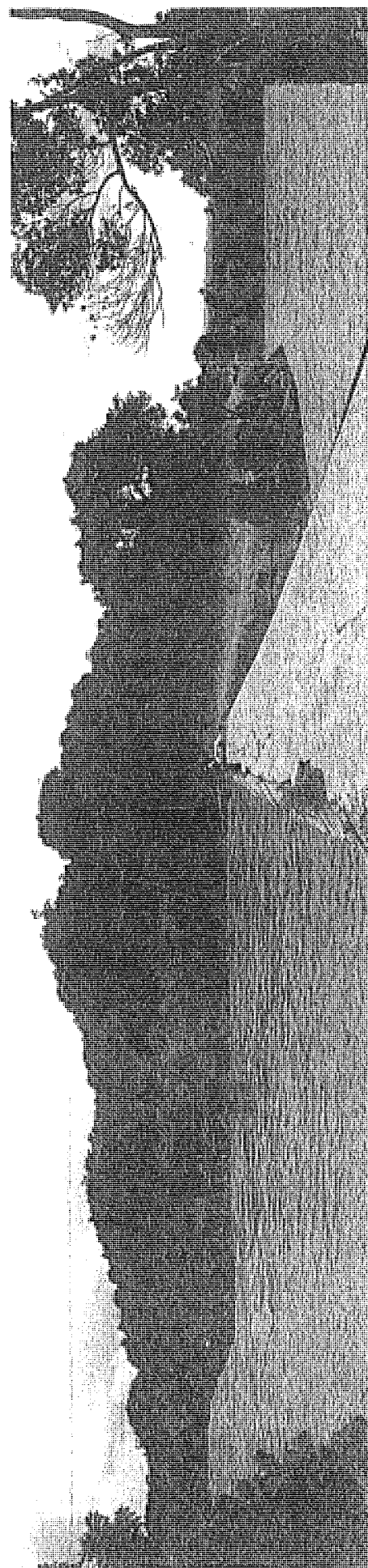
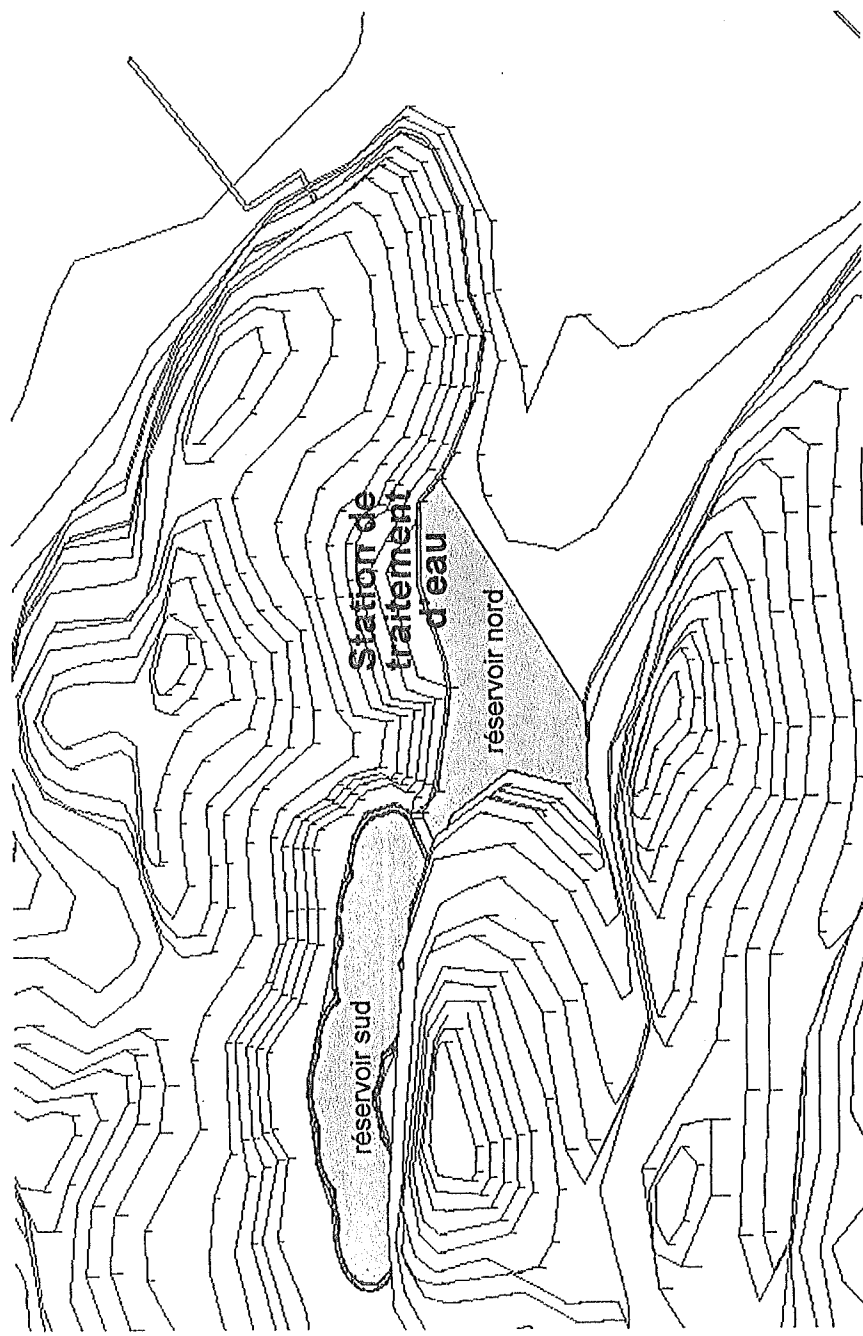
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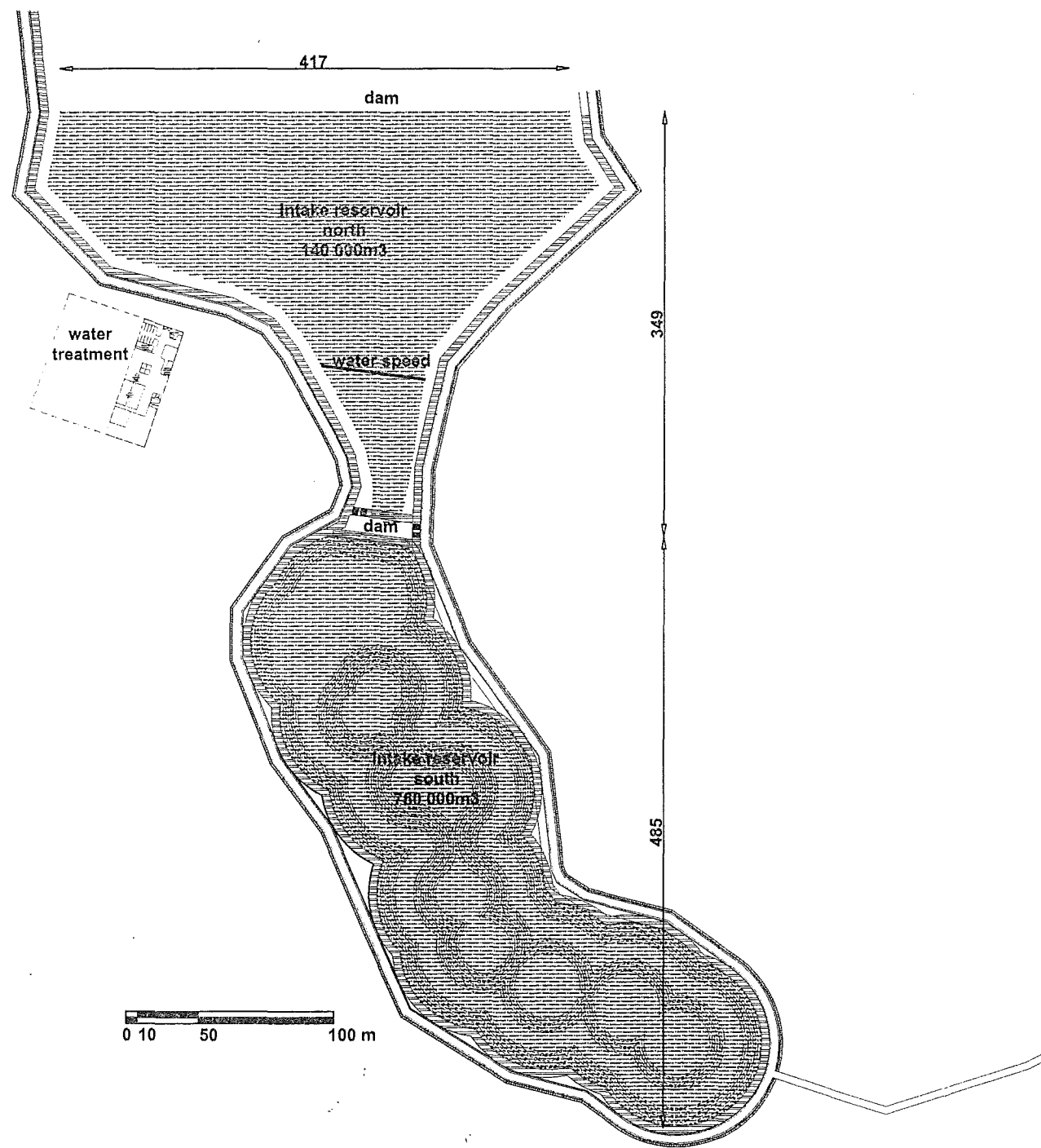
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Volume de 760 000m³
Altitude +49 m

Réservoir nord

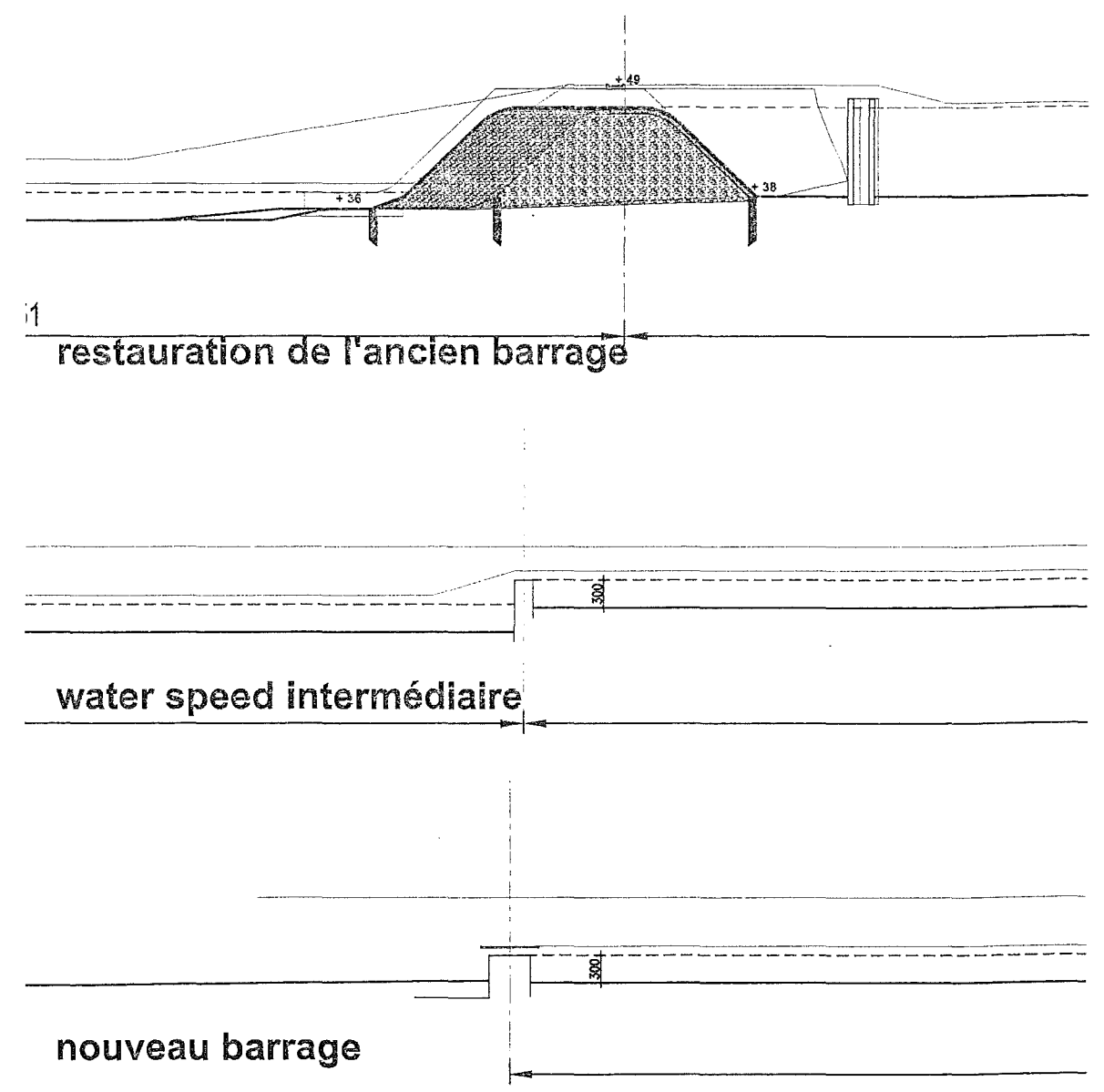
Superficie de 70 000m²
Volume d'eau 140 000m³
Altitude + 38 m

Station de traitement
Superficie 10 000m²
Altitude + 39m

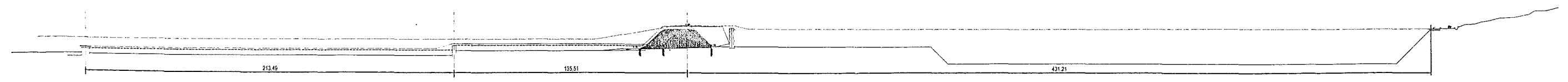




plan masse



coupe générale



WATER SUPPLY SYSTEM PROJECT
KEP CITY

MASTER PLAN

MAITRISE D'OUVRAGE
WESTERN COASTAL DEVELOPMENT CO., Ltd
house 21, street 9 Sangkat Tonle Bassac
Khan Chamcar Morn, Phnom Penh CAMBODIA
tel 855 16 837 070 mail: phunvorn_2006@yahoo.com

MAITRISE D'OEUVRE
A C Y C ARCHITECTES DPLG
54, AVENUE LENINE • 94250 GENTILLY
tel : 01 57 21 05 22
e-mail: contact@acyc-architectes.com

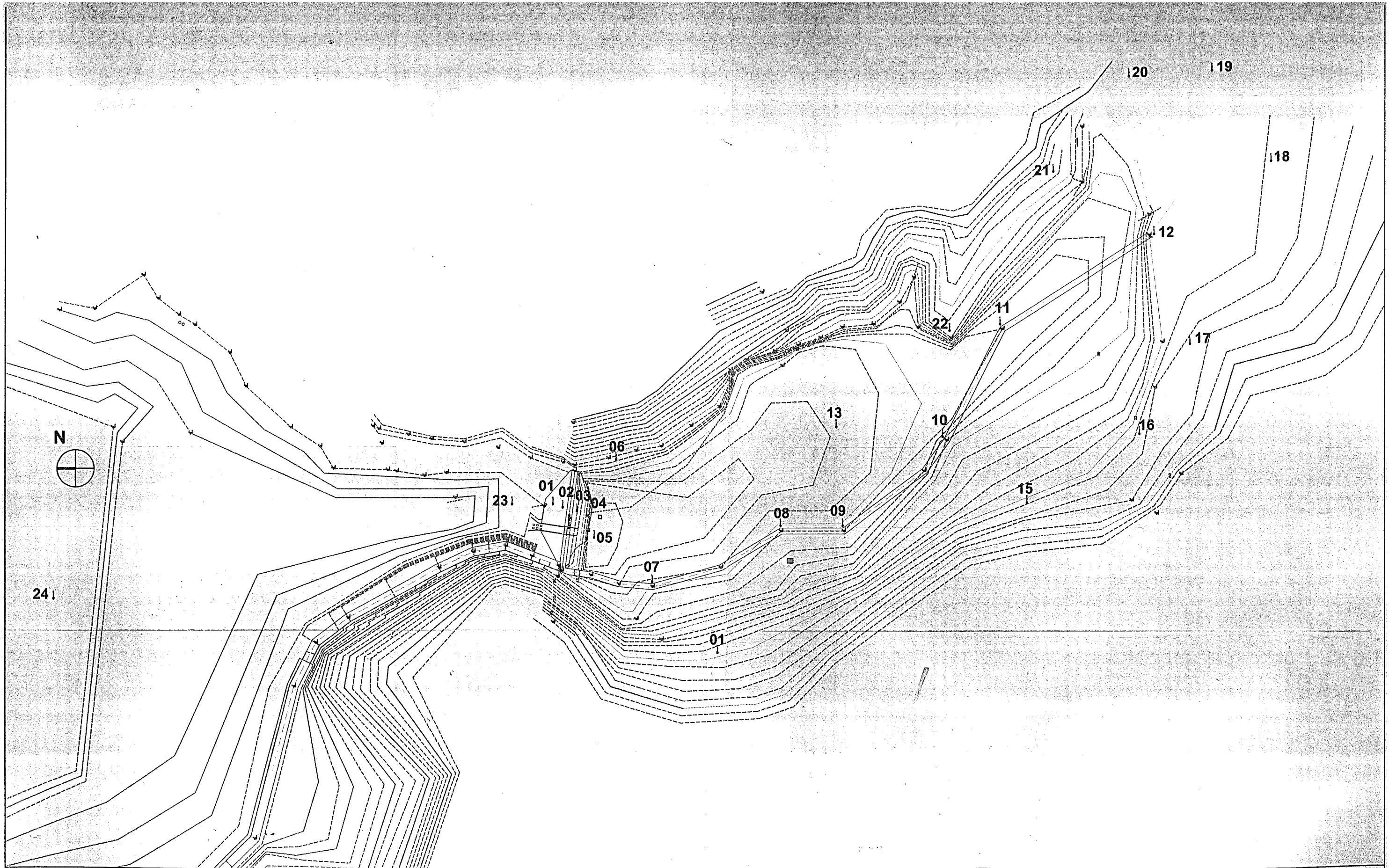
BUREAU D'ETUDES
LY Design Engineering Cambodia.LTD
N°16, st 202, Sangkat Phsar Depot I
Khan Toulkor, Phnom Penh, Cambodia
tel : (855) 12 600 765
e-mail: S.ly@lydec.fr

RESERVOIRS
GEOMETRIE

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WATER SUPPLY SYSTEM PROJECT

KEP CITY

MASTER PLAN

MAITRISE D'OUVRAGE

WESTERN COASTAL DEVELOPMENT CO., Ltd
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