ROP ISSUES:                          1/2/2011
  S14(1)

                    SEQURITY OFFICES
                    JP, PH, PO, DD + GJ (GRID MGR),
                    DB, GC + PO (DERM) KW + MD (QLD

SCENARIOS:

1. ADJUSTMENTS TO RELEASE STRATEGY
2. FSL 65%
3.   ″    ″    + ″
4.   ″    75%  + FLOOD MANUAL @ 100%
5.   ″    ″    +   ″      ″    @ 75%
6.   ″    80%  +   ″      ″    @ 100%

──> REDUCED WATER LEVELS DOWNSTREAM

NO FURTHER ADVICE UNTIL PEER REVIEW
AND INSURANCE (COMPANY) REVIEW

IS IT A QUESTION OF DOES MANUAL + FSL DELIVER
LEVEL OF FLOOD MITIGATION EXPECTED?

OR

IS IT WHAT IS THE LEVEL OF FLOOD
MITIGATION REQUIRED?

CLAUSES 29 + 74

NEXT MONDAY

## Scenarios for Operation of Wivenhoe Dam January 2011

### Preliminary Modelling results

### Variation in Initial Wivenhoe Dam Level

An assessment of the risk criteria for three initial levels of Wivenhoe Dam was undertaken with the following assumptions:

- Initial levels of Wivenhoe Dam were 87.1%, 70% and 50%
- All other storages were set at 100% initially.
- No NPI2 for the duration of the modelling
- Simulation start was February 2011, with initial dam levels January 2011
- Price path 2010 – 2015 demands
- No Tugun desalination above 60% Key Water Grid Storages, full desalination below 60%

All scenarios passed the SOP risk criteria as shown below in the Table 1.

### Table 1

| SOP | | | |
|---|---|---|---|
| Volume of water stored by all Key Water Grid Storages | Probability of reaching stored volume | | |
| | 1 year | 3 years | 5 years |
| 40% | <.2% | NA | <5% |
| 30% | NA | <.5% | <1% |

| Scenario - Wivenhoe 87% (Case 2) | | | |
|---|---|---|---|
| Volume of water stored by all Key Water Grid Storages | Probability of reaching stored volume | | |
| | 1 year | 3 years | 5 years |
| 40% | <.01% | NA | 0.09% |
| 30% | NA | <.01% | <.01% |

| Scenario - Wivenhoe 70% (Case 4) | | | |
|---|---|---|---|
| Volume of water stored by all Key Water Grid Storages | Probability of reaching stored volume | | |
| | 1 year | 3 years | 5 years |
| 40% | <.01% | NA | 0.20% |
| 30% | NA | <.01% | 0.01% |

| Scenario - Wivenhoe 50% (Case 6) | | | |
|---|---|---|---|
| Volume of water stored by all Key Water Grid Storages | Probability of reaching stored volume | | |
| | 1 year | 3 years | 5 years |
| 40% | <.01% | NA | 0.48% |
| 30% | NA | <.01% | 0.01% |

Below in Table 2 are some of the results comparing the probability of reaching 40% for the scenarios run so far:

**Table 2**

| Case | % Reduction Wivenhoe (from full supply) | Volume of Water Released from Wivenhoe Dam (ML) | %reduction of Grid 12 Storages (from full supply) | Probability of reaching 60% within 5 years (desalination trigger) | Probability of reaching 40% within 5 years (PRW trigger) |
|------|------|---------|------|---|---|
| 1 | 10 | 116,500 | 5.6 | | |
| 2 | 12.9 | 150,285 | 7.3 | | .09% |
| 3 | 20 | 233,000 | 11.3 | | |
| 4 | 30 | 349,500 | 16.9 | | .2% |
| 5 | 40 | 466,000 | 22.5 | | |
| 6 | 50 | 582,500 | 28.1 | | .48% |

**Wivenhoe Dam initially at 50%, with varied initial Baroon Pocket and Hinze dam levels**

An assessment of the effect on risk criteria of lower initial Hinze and Baroon Pocket dam levels was undertaken with the following assumptions:

- Initial level of Wivenhoe Dam 50%
- Baroon Pocket and Hinze Dam initial levels at 50%
- All other storages were set at 100% initially.
- No NPI2 for the duration of the modelling
- Simulation start was February 2011, with initial dam levels January 2011
- Price path 2010 – 2015 demands
- No Tugun desalination above 60% Key Water Grid Storages, full desalination below 60%

Both scenarios passed the risk criteria as shown in Table 3 below.

**Table 3**

**SOP**

| Volume of water stored by all Key Water Grid Storages | Probability of reaching stored volume | | |
|------|------|------|------|
| | 1 year | 3 years | 5 years |
| 40% | <.2% | NA | <5% |
| 30% | NA | <.5% | <1% |

**50/50/50%**

| Volume of water stored by all Key Water Grid Storages | Probability of reaching stored volume | | |
|------|------|------|------|
| | 1 year | 3 years | 5 years |
| 40% | <.01% | NA | 0.49% |
| 30% | NA | 0.01% | .03%% |

Table 4 compares the risk criteria for all scenarios.

**Table 4**

| Wivenhoe/Baroon/Hinze levels | 50/50/50 | 50/100/100 | 70/100/100 | 87/100/100 | SOP |
|---|---|---|---|---|---|
| 40% SEQ volume | | | | | |
| 1 year | <.01% | <.01% | <.01% | <.01% | <.2% |
| 5 year | 0.49% | 0.48% | 0.20% | 0.09% | <5% |
| 30% SEQ volume | | | | | |
| 3 years | 0.01% | <.01% | <.01% | <.01% | <.5% |
| 5 years | 0.03% | <.01% | 0.01% | <.01% | <1% |

Storage behaviour curves for varying probabilities of exceedance are shown below in Figures 1 and 2.
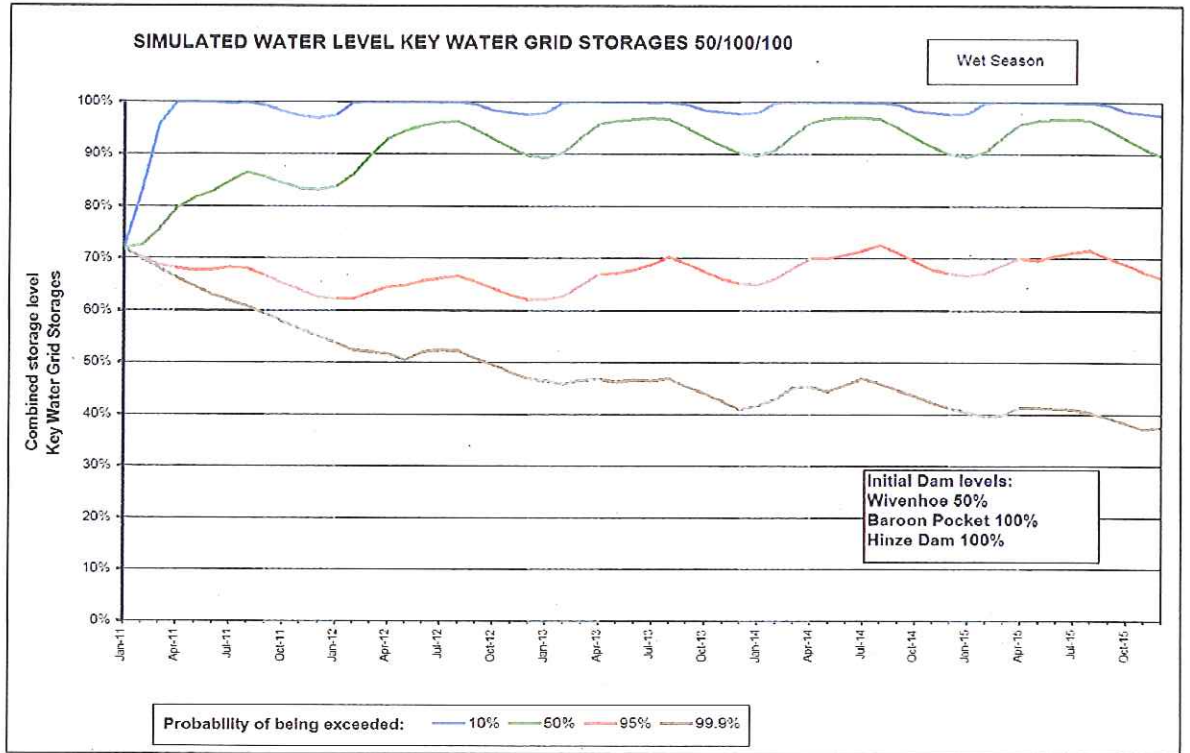
**Figure 1**



SIMULATED WATER LEVEL KEY WATER GRID STORAGES 50/100/100

Wet Season

Initial Dam levels:
Wivenhoe 50%
Baroon Pocket 100%
Hinze Dam 100%

Probability of being exceeded:  —— 10%  —— 50%  —— 95%  —— 99.9%

**Figure2**



SIMULATED WATER LEVEL KEY WATER GRID STORAGES 50/50/50

Wet Season

Initial Dam levels:
Wivenhoe 50%
Baroon Pocket 50%
Hinze Dam 50%

Probability of being exceeded:  —— 10%  —— 50%  —— 95%  —— 99.9%