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[Appendix- A]

| Fault Record for RO-1 Unit |                       |   |   |                  |
|----------------------------|-----------------------|---|---|------------------|
|                            | Item                  | Time of start<br>Failure<br>(mm/dd/yyhh:mm) | Time of<br>Restoration<br>(mm/dd/yyhh:mm) | Period<br>in hrs |
| 1                          | Energy recovery Unit  | 12/21/11 6:50 PM                            | 12/21/11 11:21 PM                         | 4.52             |
| 2                          | Energy recovery Unit  | 2/9/12 2:40 PM                              | 2/13/12 4:34 PM                           | 97.90            |
| 3                          | Chemical feeding unit | 2/10/12 9:12 AM                             | 2/10/12 9:50 AM                           | 0.63             |
| 4                          | Energy recovery Unit  | 1/16/12 10:09 AM                            | 1/16/12 10:53 AM                          | 0.73             |
| 5                          | HP pump VSD           | 12/2/11 2:00 PM                             | 12/30/11 8:30 AM                          | 666.50           |
| 6                          | Chemical feeding unit | 12/20/11 2:02 PM                            | 12/20/11 3:45 PM                          | 1.72             |
| 7                          | RO membrane unit      | 12/8/11 9:00 PM                             | 12/10/11 8:57 AM                          | 35.95            |
| 8                          | RO membrane unit      | 12/4/11 10:10 AM                            | 12/10/11 8:58 AM                          | 142.80           |
| 9                          | RO membrane unit      | 12/1/11 10:13 AM                            | 12/1/11 5:04 PM                           | 6.85             |
| 10                         | RO membrane unit      | 11/30/11 3:25 PM                            | 12/1/11 9:14 AM                           | 17.82            |
| 11                         | RO membrane unit      | 11/29/11 4:40 PM                            | 11/30/11 3:25 PM                          | 22.75            |
| 12                         | RO feed water pump    | 11/19/11 4:02 PM                            | 11/30/11 3:25 PM                          | 263.38           |
| 13                         | Chemical feeding unit | 11/3/11 11:20 AM                            | 11/3/11 3:40 PM                           | 4.33             |
| 14                         | HP pump VSD           | 11/2/11 3:11 AM                             | 11/2/11 5:12 PM                           | 14.02            |
| 15                         | HP pump VSD           | 10/27/11 2:05 PM                            | 10/27/11 5:42 PM                          | 3.62             |
| 16                         | RO feed water pump    | 11/19/11 3:40 PM                            | 11/19/11 5:50 PM                          | 2.10             |
| 17                         | Chemical feeding unit | 11/12/11 3:27 PM                            | 11/16/11 5:49 PM                          | 98.37            |
| 18                         | Pre filter            | 10/4/11 2:36 PM                             | 10/4/11 6:22 PM                           | 3.77             |
| 19                         | Chemical feeding unit | 10/2/11 2:23 PM                             | 10/2/11 7:06 PM                           | 4.72             |
| 20                         | HP pump VSD           | 10/1/11 3:22 PM                             | 10/1/2011 17:20                           | 1.97             |
| 21                         | RO membrane unit      | 9/20/11 11:35 AM                            | 10/27/11 5:30 PM                          | 893.92           |
| 22                         | Pre filter            | 9/13/11 6:18 PM                             | 9/13/11 11:00 PM                          | 4.70             |
| 23                         | Chemical feeding unit | 9/13/11 2:45 PM                             | 9/15/11 7:55 PM                           | 53.17            |
| 24                         | Energy recovery Unit  | 6/30/12 10:10 AM                            | 6/30/12 2:27 PM                           | 4.28             |
| 25                         | HP pump VSD           | 12/7/11 10:10 AM                            | 2/14/12 8:05 AM                           | 1653.92          |
| 26                         | RO membrane unit      | 1/15/12 9:10 AM                             | 2/29/12 1:42 PM                           | 1084.53          |
| 27                         | RO membrane unit      | 2/28/12 2:47 PM                             | 2/29/12 1:42 PM                           | 22.92            |
| 28                         | Pre filter            | 2/3/12 3:15 PM                              | 3/2/12 6:51 PM                            | 675.60           |
| 29                         | Pre filter            | 3/6/12 5:59 PM                              | 3/6/12 7:07 PM                            | 1.13             |
| 30                         | Chemical feeding unit | 3/12/12 7:38 PM                             | 3/13/12 10:03 PM                          | 26.42            |
| 31                         | Chemical feeding unit | 3/15/12 10:40 AM                            | 3/18/12 3:05 PM                           | 76.42            |
| 32                         | Chemical feeding unit | 3/29/12 2:31 PM                             | 3/31/12 8:34 AM                           | 42.05            |
| 33                         | Chemical feeding unit | 3/29/12 9:29 AM                             | 4/3/12 2:49 PM                            | 125.33           |
| 34                         | HP pump VSD           | 4/6/12 10:42 AM                             | 4/6/12 1:02 PM                            | 2.33             |
| 35                         | Pre filter            | 4/18/12 10:20 AM                            | 4/18/12 11:36 AM                          | 1.27             |
| 36                         | RO membrane unit      | 4/9/12 10:32 AM                             | 4/13/12 8:49 AM                           | 94.28            |
| 37                         | HP pump VSD           | 4/9/12 9:08 AM                              | 4/9/12 12:10 PM                           | 3.03             |
| 38                         | HP pump VSD           | 4/30/12 4:17 PM                             | 4/30/12 7:26 PM                           | 3.15             |
| 39                         | RO membrane unit      | 5/17/12 8:52 AM                             | 5/17/12 8:58 AM                           | 0.10             |

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|------------------|-----------------------|------------------|-----------------|----------|
| 40               | HP pump VSD           | 5/5/12 12:00 AM  | 5/22/12 9:00 PM | 429.00   |
| 41               | RO membrane unit      | 5/23/12 12:20 PM | 5/24/12 4:10 PM | 27.83    |
| 42               | RO membrane unit      | 6/7/12 8:53 AM   | 6/7/12 6:50 PM  | 9.95     |
| 43               | Pre filter            | 6/18/12 3:25 PM  | 6/18/12 4:06 PM | 0.68     |
| 44               | Chemical feeding unit | 6/19/12 10:08 AM | 6/19/12 6:13 PM | 8.08     |
| 45               | RO feed water pump    | 6/23/12 9:57 AM  | 6/23/12 5:17 PM | 7.33     |
| 46               | HP pump VSD           | 6/25/12 3:00 PM  | 6/25/12 5:46 PM | 2.77     |
| Total Outage (h) |                       |                  |                 | 6,648.70 |



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[Appendix- B]

| <b>Fault Record for RO-2 Unit</b> |                       |  |   |                  |
|-----------------------------------|-----------------------|--|---|------------------|
|                                   | Item                  | <u>Time of start<br/>of Failure</u><br>(mm/dd/yyhh:mm) | <u>Time of<br/>Restoration</u><br>(mm/dd/yyhh:mm) | Period<br>in hrs |
| 1                                 | HP pump VSD           | 7/12/11 10:10 AM                                       | 2/14/12 8:05 AM                                   | 5205.92          |
| 2                                 | HP pump VSD           | 8/29/11 5:22 PM  | 8/30/11 3:00 PM                                   | 21.63            |
| 3                                 | HP pump VSD           | 8/30/11 4:00 PM  | 9/2/11 8:46 AM                                    | 64.77            |
| 4                                 | Pre filter            | 9/13/11 2:45 PM  | 9/13/11 11:00 PM                                  | 8.25             |
| 5                                 | RO membrane unit      | 11/29/11 4:40 PM                                       | 11/30/11 3:25 PM                                  | 22.75            |
| 6                                 | RO membrane unit      | 11/30/11 3:25 PM                                       | 12/1/11 9:14 AM                                   | 17.82            |
| 7                                 | RO membrane unit      | 12/1/11 10:13 AM                                       | 12/1/11 5:04 PM                                   | 6.85             |
| 8                                 | RO membrane unit      | 12/4/11 10:10 AM                                       | 2/10/11 8:58 AM                                   | 142.80           |
| 9                                 | Energy recovery Unit  | 12/10/11 9:58 AM                                       | 12/10/11 5:26 PM                                  | 7.47             |
| 10                                | HP pump VSD           | 12/11/11 4:00 PM                                       | 12/10/11 3:40 PM                                  | 1.90             |
| 11                                | Chemical feeding unit | 12/20/11 2:32 PM                                       | 12/20/11 3:45 PM                                  | 1.22             |
| 12                                | RO membrane unit      | 12/25/11 10:38 AM                                      | 12/26/11 3:34 PM                                  | 28.93            |
| 13                                | Pre filter            | 1/3/12 5:52 PM   | 1/3/12 9:13 PM                                    | 3.35             |
| 14                                | Pre filter            | 2/2/12 1:49 PM   | 2/2/12 5:50 PM                                    | 4.02             |
| 15                                | Pre filter            | 2/3/12 3:15 PM   | 2/3/12 6:51 PM                                    | 3.60             |
| 16                                | RO feed water pump    | 2/8/12 8:40 AM   | 2/8/12 2:25 PM                                    | 5.75             |
| 17                                | Energy recovery Unit  | 2/9/12 1:40 PM   | 2/9/12 4:02 PM                                    | 2.37             |
| 18                                | Pre filter            | 2/19/12 5:30 PM  | 2/19/2012 21:15                                   | 3.75             |
| 19                                | Chemical feeding unit | 3/3/12 9:22 AM   | 3/3/12 5:45 PM                                    | 8.38             |
| 20                                | Pre filter            | 3/5/12 3:30 PM   | 3/5/12 5:45 PM                                    | 2.25             |
| 21                                | Energy recovery Unit  | 3/12/12 4:27 PM  | 3/12/12 7:33 PM                                   | 3.10             |

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|                  |                      |                  |                  |         |
|------------------|----------------------|------------------|------------------|---------|
| 22               | HP pump VSD          | 4/19/12 3:07 PM  | 6/8/12 8:21 PM   | 1205.23 |
| 23               | RO feed water pump   | 4/23/12 9:19 AM  | 4/23/12 10:48 AM | 1.48    |
| 24               | RO feed water pump   | 4/23/12 12:20 PM | 4/24/12 5:09 PM  | 28.82   |
| 25               | RO membrane unit     | 5/20/12 1:39 PM  | 5/20/12 3:12 PM  | 1.55    |
| 26               | HP pump VSD          | 5/27/12 3:55 PM  | 8/27/12 7:16 PM  | 2211.35 |
| 27               | RO membrane unit     | 5/28/12 12:00 AM | 5/29/12 11:33 AM | 35.55   |
| 28               | RO membrane unit     | 5/28/12 2:47 PM  | 5/28/12 4:09 PM  | 1.37    |
| 29               | RO membrane unit     | 6/1/12 9:35 AM   | 6/1/12 10:37 AM  | 1.03    |
| 30               | RO membrane unit     | 6/9/12 12:02 AM  | 6/9/12 1:10 AM   | 1.13    |
| 31               | RO membrane unit     | 6/21/12 7:15 AM  | 6/29/12 9:30 PM  | 206.25  |
| 32               | Energy recovery Unit | 7/7/12 10:02 AM  | 7/9/12 11:43 AM  | 49.68   |
| 33               | Energy recovery Unit | 7/12/12 2:45 PM  | 7/13/12 3:54 PM  | 25.15   |
| Total Outage (h) |                      |                  |                  | 9.3547  |



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[Appendix - C]

| Fault Record for RO-3 Unit |                       |   |  |             |
|----------------------------|-----------------------|---|--|-------------|
|                            | Item                  | Time of start<br>Time of Failure<br>(mm/dd/yyhh:mm) | Time of Restoration<br>(mm/dd/yyhh:mm) | Period(hrs) |
| 1                          | RO membrane unit      | 2/10/12 9:12 AM                                     | 2/10/12 1:15 PM                        | 4.05        |
| 2                          | Pre filter            | 2/3/12 1:44 PM                                      | 2/3/12 3:21 PM                         | 1.62        |
| 3                          | HP pump VSD           | 12/29/11 2:00 PM                                    | 12/30/11 8:30 AM                       | 18.50       |
| 4                          | HP pump VSD           | 12/20/11 2:32 PM                                    | 12/30/11 12:00 AM                      | 225.47      |
| 5                          | Chemical feeding unit | 12/20/11 2:32 PM                                    | 12/20/11 3:45 PM                       | 1.22        |
| 6                          | RO membrane unit      | 12/20/11 9:10 AM                                    | 12/28/11 1:54 PM                       | 196.73      |
| 7                          | RO membrane unit      | 12/4/11 10:10 AM                                    | 12/10/11 8:58 AM                       | 142.80      |
| 8                          | RO membrane unit      | 12/4/11 10:10 AM                                    | 12/10/11 8:58 AM                       | 142.80      |
| 9                          | RO membrane unit      | 12/1/11 10:13 AM                                    | 12/1/11 5:04 PM                        | 6.85        |
| 10                         | RO membrane unit      | 11/30/11 3:25 PM                                    | 12/1/11 9:14 AM                        | 17.82       |
| 11                         | Chemical feeding unit | 11/3/11 11:20 AM                                    | 11/3/11 3:25 PM                        | 4.08        |
| 12                         | Energy recovery Unit  | 10/27/11 2:05 PM                                    | 10/27/11 3:42 PM                       | 1.62        |
| 13                         | Pre filter            | 10/4/11 2:36 PM                                     | 10/4/11 6:22 PM                        | 3.77        |
| 14                         | RO membrane unit      | 10/2/11 2:23 PM                                     | 10/2/11 7:05 PM                        | 4.70        |
| 15                         | RO membrane unit      | 10/2/11 2:04 PM                                     | 10/2/11 7:05 PM                        | 5.02        |
| 16                         | RO membrane unit      | 9/20/11 4:35 AM                                     | 10/27/11 5:30 PM                       | 893.92      |
| 17                         | Energy recovery Unit  | 9/2/11 5:59 PM                                      | 9/3/11 2:40 PM                         | 20.68       |
| 18                         | HP pump VSD           | 9/5/11 10:20 AM                                     | 9/6/11 1:45 PM                         | 27.42       |
| 19                         | Chemical feeding unit | 6/14/12 2:30 PM                                     | 6/14/2012 14:50                        | 0.33        |
| 20                         | Pre filter            | 6/12/12 1:48 PM                                     | 6/12/12 3:16 PM                        | 1.47        |
| 21                         | RO membrane unit      | 1/15/12 9:10 AM                                     | 2/29/12 1:42 PM                        | 1084.53     |
| 22                         | RO membrane unit      | 2/28/12 2:47 PM                                     | 2/29/12 1:42 PM                        | 22.92       |
| 23                         | Pre filter            | 2/3/12 3:15 PM                                      | 3/2/12 6:51 PM                         | 675.60      |
| 24                         | Pre filter            | 3/6/12 5:59 PM                                      | 3/6/12 7:07 PM                         | 1.13        |
| 25                         | RO membrane unit      | 3/1/12 3:07 PM                                      | 3/6/12 11:16 AM                        | 116.15      |
| 26                         | Chemical feeding unit | 3/12/12 9:48 AM                                     | 3/12/12 3:45 PM                        | 5.95        |
| 27                         | HP pump VSD           | 2/13/12 4:58 AM                                     | 3/27/12 6:50 PM                        | 1045.87     |
| 28                         | HP pump VSD           | 2/13/12 5:02 PM                                     | 3/27/12 6:28 PM                        | 1033.43     |
| 29                         | Pre filter            | 4/7/12 4:10 PM                                      | 4/7/12 4:55 PM                         | 0.75        |
| 30                         | HP pump VSD           | 4/12/12 8:49 AM                                     | 4/13/12 5:50 PM                        | 33.02       |
| 31                         | RO membrane unit      | 5/10/12 4:48 PM                                     | 5/25/12 1:26 PM                        | 356.63      |
| 32                         | RO membrane unit      | 6/3/12 12:00 AM                                     | 7/12/12 12:00 PM                       | 948.00      |
| Total Outage (h)           |                       |   |  | 7,044.83    |

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[Appendix – D]

| Fault record for UF filter 01 |                            |   |  |                  |
|-------------------------------|----------------------------|---|--|------------------|
|                               | Item                       | <u>Time of start</u><br><u>of Failure</u><br><small>(mm/dd/yyhh:mm)</small> | <u>Time of</u><br><u>Restoration</u><br><small>(mm/dd/yyhh:mm)</small> | Period<br>in hrs |
| 1                             | UF Filter vacuum pump#1    | 3/10/11 10:14 AM  | 3/26/11 5:40 PM  | 391.43           |
| 2                             | UF auto cleaning filter #1 | 11/10/11 10:00 PM   | 12/1/11 8:57 AM  | 490.95           |
| 3                             | UF Chemical dosing pump    | 12/20/11 2:02 PM  | 12/20/11 3:45 PM   | 1.72             |
| 4                             | UF auto cleaning filter #1 | 12/28/11 6:50 PM  | 12/29/11 11:21 PM  | 28.52            |
| 5                             | UF Filter vacuum pump#1    | 2/9/12 2:40 PM  | 2/13/12 4:34 PM  | 97.90            |
| 6                             | UF Feed water pump#1       | 2/10/12 9:12 AM   | 2/10/12 9:50 AM  | 0.63             |
| 7                             | UF Chemical dosing pump    | 3/8/12 12:00 AM   | 6/8/12 5:00 PM   | 2,225.00         |
| Total outage(h)               |                            |   |  | 3,236.15         |

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| Fault record for UF filter 02 |                            |   |  |                  |
|-------------------------------|----------------------------|---|--|------------------|
|                               | Item                       | <u>Time of start</u><br><u>of Failure</u><br><small>(mm/dd/yyhh:mm)</small> | <u>Time of</u><br><u>Restoration</u><br><small>(mm/dd/yyhh:mm)</small> | Period<br>in hrs |
| 1                             | UF auto cleaning filter #2 | 9/13/11 10:45 AM  | 1/6/12 8:05 AM   | 2757.83          |
| 2                             | UF Filter vacuum pump#2    | 2/8/12 8:40 AM  | 2/8/12 2:25 PM   | 5.75             |
| 3                             | UF Feed water pump#1       | 2/10/12 1:50 PM   | 2/11/12 4:02 PM  | 26.20            |
| 4                             | UF Chemical dosing pump    | 6/19/12 3:31 PM   | 6/19/12 4:22 PM  | 0.85             |
| 5                             | UF Feed water pump#1       | 8/21/12 8:15 AM   | 9/29/12 10:30 PM   | 950.25           |
| Total outage (h)              |                            |   |  | 3,740.38         |

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| Fault record for UF filter 3 |                            |   |  |                  |
|------------------------------|----------------------------|---|--|------------------|
|                              | Item                       | <u>Time of start</u><br><u>of Failure</u><br><small>(mm/dd/yyhh:mm)</small> | <u>Time of</u><br><u>Restoration</u><br><small>(mm/dd/yyhh:mm)</small> | Period<br>in hrs |
| 1                            | UF auto cleaning filter #3 | 1/10/11 9:46 AM   | 2/10/11 2:49 PM  | 749.05           |
| 2                            | UF Chemical dosing pump    | 5/10/11 10:12 AM  | 6/10/11 11:15 PM   | 757.05           |
| 3                            | UF Filter vacuum pump#3    | 7/20/11 10:14 AM  | 7/26/11 5:40 PM  | 151.43           |
| 4                            | UF auto cleaning filter #3 | 1/4/12 1:14 PM  | 1/9/12 7:05 PM   | 125.85           |
| 5                            | UF Filter vacuum pump#3    | 3/8/12 12:00 AM   | 5/8/12 5:00 PM   | 1481.00          |
| Total outage (h)             |                            |   |  | 3,264.38         |

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