

# 33.9 MW BUNDLED WIND POWER PROJECT IN STATES OF KARNATAKA AND TAMIL NADU

Document Prepared By Simran Wind Project Pvt Ltd

<b>Project Title</b>	<i>33.9 MW BUNDLED WIND POWER PROJECT IN STATES OF KARNATAKA AND TAMIL NADU</i>
<b>Version</b>	<i>3.0</i>
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<b>Project ID</b>	<i>NA</i>
<b>Monitoring Period</b>	<i>01-04-2008 to 20-12-2010</i>
<b>Prepared By</b>	<i>Simran Wind Project Pvt Ltd</i>
<b>Contact</b>	<i>Mr Satish Raval 2F and 3F, Park Plaza, North Block, 71 Park Street Kolkata, West Bengal-700019, India</i>

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## 1 PROJECT DETAILS

### 1.1 Summary Description of Project

The project activity consists of the 19 machines of Suzlon make of 1.5 MW each, and 9 nos of 0.6 MW each totalling to the capacity of 33.9 MW. The Project considered harnessed renewable resources in the region, thereby displacing non-renewable natural resources thereby ultimately leading to sustainable economic and environmental development.

The project is a bundled project activity having two investors. The project involves a total of 19 nos. of WEGs of 1.5 MW each and 9 nos of 0.6 MW each.

The project under consideration is located in the states of Karnataka and Tamil Nadu. The project is owned by Super Wind Project Private Ltd. and Simran Wind Project Private Ltd.

The first machine under the project activity was commissioned on 30/03/2008 and the last machine under the project activity was commissioned on 05/02/2009. The expected operational lifetime of the project is for 20 years. The total emission reductions achieved under this monitoring period is **149,560 tCO<sub>2</sub>**.

### 1.2 Sectoral Scope and Project Type

The project activity is considered under zero-emissions 'grid-connected electricity generation from renewable sources' that generates electricity in excess of 15 MW (limit for small scale project). Therefore as per the scope of the project activity enlisted in the 'list of sectoral scopes and related approved baseline and monitoring methodologies', the project activity may principally be categorized in Scope Number 1, Sectoral Scope - Energy industries (renewable/ non-renewable sources).

### 1.3 Project Proponent

Contact Information of Participants in the Project Activity:

Mr. Satish Raval

2F and 3F, Park Plaza, North Block,

71 Park Street

Kolkata,

West Bengal-700019,

India

#### 1.4 Other Entities Involved in the Project

None

#### 1.5 Project Start Date

01/04/2008, being the date of commissioning of first WEG in the project

#### 1.6 Project Crediting Period

The crediting period start date is 01/04/2008 and the end date is 20/12/2010

#### 1.7 Project Location

The project is located located in the states of Karnataka and Tamil Nadu and spreads over the Gadag and Chitradurga district in Karnataka and Dindigul, Coimbatore and Erode in Tamil Nadu. The details of the Wind Energy Generators are-

Sl.No	Loc. No	MW	Commissioning date	Site	District
<b>KARNATAKA</b>					
1	K342	1.50	31-Dec-08	Mallikarjunpur	Gadag
2	K345	1.50	31-Dec-08	Jalwadgi	Gadag
3	K346	1.50	30-Sep-08	Jalwadgi	Gadag
4	K347	1.50	31-Dec-08	Jalwadgi	Gadag
5	K350	1.50	30-Sep-08	Jalwadgi	Gadag
6	K69	1.50	30-Sep-08	Elkurnahalli	Chitradurga
7	K70	1.50	30-Sep-08	Elkurnahalli	Chitradurga
8	K71	1.50	30-Sep-08	Elkurnahalli	Chitradurga

Sl.No	Loc. No	MW	Commissioning date	Site	District
<b>TAMILNADU</b>					
1	E767	0.60	30-Sep-08	Kolumangondan	Dindigul
2	E777	0.60	28-Jul-08	Kolumangondan	Dindigul
3	E778	0.60	30-Sep-08	Kovilammalayam	Dindigul
4	E779	0.60	28-Jul-08	Kovilammalayam	Dindigul

5	E780	0.60	28-Jul-08	Kovilammalayam	Dindigul
6	E781	0.60	28-Jul-08	Kovilammalayam	Dindigul
7	E782	0.60	5-Aug-08	Kovilammalayam	Dindigul
8	E797	0.60	28-Sep-08	Kattur	Coimbatore
9	E86	1.50	1-Sep-08	Kattur	Coimbatore
10	G-557	0.60	31-Mar-08	Midapadi	Dindigul
11	G-970	1.50	31-Mar-08	Kannamanaickanur	Coimbatore
12	Q48	1.50	30-Mar-08	V.Kallipalayam	Coimbatore
13	Q51	1.50	31-Mar-08	V.Kallipalayam	Coimbatore
14	Q199	1.50	31-Mar-08	Kundadam	Erode
15	Q220	1.50	31-Mar-08	Kethairev	Erode
16	Q394	1.50	30-Mar-08	Kethairev	Erode
<b>KARNATAKA</b>					
1	H29	1.5	30-Sep-08	Koppala halli	Hassan
2	H34	1.5	30-Sep-08	Koppalahalli	Hassan
3	K75	1.5	31-Dec-08	Elkurnahalli	Chitradurga
4	K76	1.5	5-Feb-09	Elkurnahalli	Chitadurga

## 1.8 Title and Reference of Methodology

The project is part of the Voluntary Carbon Standards, which is a GHG program that has been approved by the VCS Board. Accordingly, under the VCS program, as per the modalities and procedures for large-scale CDM project activities, the type and category of the project activity is as under:

**Sectoral Scope:** 1, Energy industries (renewable/ non-renewable sources)

**Project Category:** ACM0002, Version-10, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"

## 2 IMPLEMENTATION STATUS

### 2.1 Implementation Status of the Project Activity

The first WEG was commissioned on 31<sup>st</sup> March 2008 and the last machine was commissioned on 5<sup>th</sup> February 2009. The commissioning schedule is provided below:

VCS (Simran)					
SI.No	Loc. No	MW	Commissioning date	Site	District
<b>TAMILNADU</b>					
1	E767	0.60	30-Sep-08	Kolumangondan	Dindigul
2	E777	0.60	28-Jul-08	Kolumangondan	Dindigul
3	E778	0.60	30-Sep-08	Kovilammalayam	Dindigul
4	E779	0.60	28-Jul-08	Kovilammalayam	Dindigul
5	E780	0.60	28-Jul-08	Kovilammalayam	Dindigul
6	E781	0.60	28-Jul-08	Kovilammalayam	Dindigul
7	E782	0.60	5-Aug-08	Kovilammalayam	Dindigul
8	E797	0.60	28-Sep-08	Kattur	Coimbatore
9	E86	1.50	1-Sep-08	Kattur	Coimbatore
10	G-557	0.60	31-Mar-08	Midapadi	Dindigul
11	G-970	1.50	31-Mar-08	Kannamanaickanur	Coimbatore
12	Q48	1.50	30-Mar-08	V.Kallipalayam	Coimbatore
13	Q51	1.50	31-Mar-08	V.Kallipalayam	Coimbatore
14	Q199	1.50	31-Mar-08	Kundadam	Erode
15	Q220	1.50	31-Mar-08	Kethairev	Erode
16	Q394	1.50	30-Mar-08	Kethairev	Erode

<b>KARNATAKA</b>					
1	H29	1.5	30-Sep-08	Koppala halli	Hassan
2	H34	1.5	30-Sep-08	Koppalahalli	Hassan
3	K75	1.5	31-Dec-08	Elkurnahalli	Chitradurga
4	K76	1.5	5-Feb-09	Elkurnahalli	Chitadurga

VCS (Super)					
SI.No	Loc. No	MW	Commissioning date	Site	District
KARNATAKA					
1	K342	1.50	31-Dec-08	Mallikarjunpur	Gadag
2	K345	1.50	31-Dec-08	Jalwadgi	Gadag
3	K346	1.50	30-Sep-08	Jalwadgi	Gadag
4	K347	1.50	31-Dec-08	Jalwadgi	Gadag
5	K350	1.50	30-Sep-08	Jalwadgi	Gadag
6	K69	1.50	30-Sep-08	Elkurnahalli	Chitradurga
7	K70	1.50	30-Sep-08	Elkurnahalli	Chitradurga
8	K71	1.50	30-Sep-08	Elkurnahalli	Chitradurga

## 2.2 Deviations from the Monitoring Plan

This is not applicable to the project activity.

## 2.3 Grouped Project

This is not applicable to the project activity.

## 3 DATA AND PARAMETERS

### 3.1 Data and Parameters Available at Validation

Data Unit / Parameter:	$EF_{OM,y}$
Data unit:	tCO2e/MWh
Description:	Operating Margin Emission Factor of Southern Regional Electricity Grid
Source of data:	<p>“CO2 Baseline Database for Indian Power Sector” published by the Central Electricity Authority, Ministry of Power, Government of India.</p> <p>The “CO2 Baseline Database for Indian Power</p>

	Sector” is available at <a href="http://www.cea.nic.in">www.cea.nic.in</a>
Value applied:	0.9985
Purpose of the data:	The data will be used to calculate baseline emissions factor
Any comment:	None

Data Unit / Parameter:	$EF_{BM,y}$
Data unit:	tCO <sub>2</sub> e/MWh
Description:	Build Margin Emission Factor of Southern Regional Electricity Grid
Source of data:	<p>“CO<sub>2</sub> Baseline Database for Indian Power Sector” published by the Central Electricity Authority, Ministry of Power, Government of India.</p> <p>The “CO<sub>2</sub> Baseline Database for Indian Power Sector” is available at <a href="http://www.cea.nic.in">www.cea.nic.in</a></p>
Value applied:	0.713
Purpose of the data:	The data will be used to calculate baseline emissions factor
Any comment:	None

### 3.2 Data and Parameters Monitored

Data Unit / Parameter:	EG <sub>ey</sub>
Data unit:	MWh (Mega-watt hour)
Description:	Electricity exported to the grid by the Project
Source of data:	Electricity exported by the project activity to the grid as per as per JMR(Form - B)
Description of measurement methods and procedures to be applied:	Net electricity exported to the grid will be measured by the two-way export/import Trivector meter. The procedures for metering and meter reading will be as per the PPA.

Frequency of monitoring/recording:	<p><u>Frequency</u>: The meter reading will be taken in the first week of every month.</p> <p><u>Recording</u>: The recording of the meter reading will be done in the hard copy format once in a month in the form of JMR certificates.</p> <p><u>Archiving Policy</u>: The data will be archived for a period of 2 years after the end of the crediting period in the hard copy format.</p>
Value monitored:	<p>Annual electricity supplied to the grid by the Project = <math>(0.6 \times 9 \times 8760 \times 30.73\%) + (1.5 \times 19 \times 8760 \times 28.91\%)</math></p> <p>= 86,735 MWh</p>
Monitoring equipment:	Trivector meters of accuracy class .2 and .5
QA/QC procedures to be applied:	QA/QC procedures are elaborated in the monitoring plan
Calculation method:	Please refer section 3.3 below
Any comment:	

### 3.3 Description of the Monitoring Plan

#### **Reporting Period**

This is the first monitoring report for the project activity. The monitoring period is from 01-04-2008 to 20-12-2010 (both days including).

#### **Monitoring Methodology**

The project is part of the Voluntary Carbon Standards, which is a GHG program that has been approved by the VCS Board. Accordingly, under the VCS program, as per the modalities and procedures for large-scale CDM project activities, the type and category of the project activity is as under:

**Sectoral Scope:** 1, Energy industries (renewable/ non-renewable sources)

**Project Category:** ACM0002, Version-10, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"

The approved consolidated baseline and monitoring methodology ACM0002 is the choice of the baseline and monitoring methodology because:

- The project represents electricity capacity additions from wind sources;
- The project is a Greenfield electricity generation from wind sources;

- The geographical and system boundaries of the grid can be clearly identified and information on the characteristics of the grid is available.

The monitoring requirements for the project activity includes:-

- Metering procedures
- Calibration Frequency
- Data Archiving
- Monitoring roles and responsibility

### **Origin of the data**

The Project is operated and managed by Suzlon. The organization follows the documentation practices to ensure the reliability and availability of the data for operation of the wind power project. The monitored data can be found from the monthly JMR reports.

Monitoring will be done as:

- a. Meter reading: Meter readings are taken jointly by the representatives of TNEB & KPTCL/BESCOM, HESCOM and Suzlon. Such meter readings shall be treated as the accurate and final measurement of the energy supplied to grid by the power producer for preceding month for the period of payment. Electronic format of daily meter readings of the respective WTG's will be collected and the same would be sent to the PP and the received data will be reviewed against the performance guarantee clause mentioned in the O&M contract and accordingly PP will be compensated by Suzlon. PP will archive this data for a period of 2 years after the crediting period.
- b. Frequency: The meter reading will be taken in the first week of every month.
- c. Recording: The recording of the meter reading will be done in the hard copy format once in a month in the form of JMR certificates.
- d. Archiving Policy: The data will be archived for a period of 2 years after the end of the crediting period in the hard copy format.

### **Managing data quality**

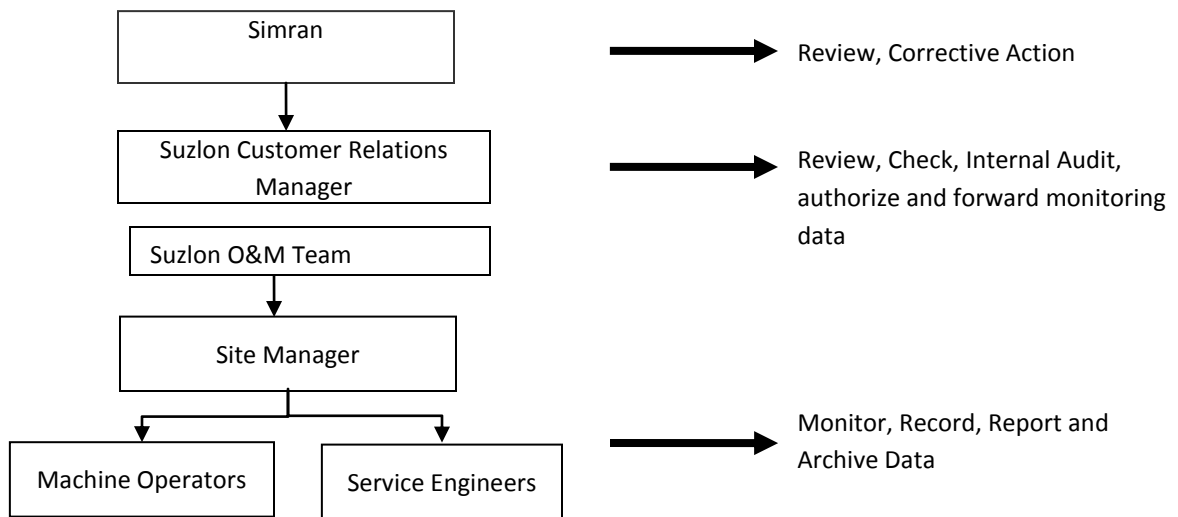
The accuracy of monitoring parameter is ensured by adhering to the calibration and testing procedure. The project will adhere to all the mandatory regulatory and statutory requirements at the state as well as national level. The data will be archived for a period of 2 years after the end of the crediting period in the hard copy format.

### **Monitoring roles and responsibilities**

The authority and responsibility of project overall project coordination in relation to the VCS validation would be with the project proponent. EPC Contractor is responsible for apportioning of the electricity generated.

The daily generation report received from Suzlon(Customer Relations Manager) will be compiled by the PP for the entire month and the same will be cross checked against the credit notes received from the Discom for any discrepancies.

The operational and management structure implemented by Simran along with Suzlon as follows



**Description of the monitoring plan**

**Metering:**

Electricity supplied to the grid is metered by the Parties (KPTCL, Suzlon and the PP) at the high voltage side of the step up transformer installed at the Project Site.

**Metering Equipment:**

Metering system for the project activity consists of one main and one check meter. Both the meters are **two-way Trivector meters capable of recording import and export of electricity** and provide output in the form of net electricity supplied to the grid. The main meter is installed and owned by the Project, whereas check meters are owned by KPTCL. The metering equipment is maintained in accordance with electricity standards prevalent in Karnataka. The meters installed are capable of recording and storing half hourly readings of all the electrical parameters for a minimum period of 35 days with digital output.

**Meter Readings:**

The Net electricity supplied to the grid is recorded by taking a Joint Meter Reading (JMR) in the presence of Officials from off-taking Utility and Suzlon representatives. The Joint meter reading contains the value of energy imported and exported and the net export to the grid during the recording period. This Joint meter reading is certified by the Executive engineer of the utility and by Suzlon Officials. These certified readings are then used by the Discom officials to prepare the tariff invoices. Thus the sole monitoring parameter for the project activity is the net electricity supplied to the grid as mentioned in the JMR, which will be crosschecked with the value mentioned in the invoices.

**Procedure for Billing:**

The PP shall submit to the designated officer of the Discom a monthly invoice for each billing period in the format prescribed by the discom from time to time setting forth those amounts payable by the discom for the delivered energy in accordance with the clauses mentioned in the PPA's

Monthly invoices shall be:

$$DE = X_1 - (X_1 * Z \%)$$

Where

DE is the delivered energy pertaining to the project

X<sub>1</sub> is the reading of the energy meter installed at the project site

Z is the % transmission line loss incurred in the transmission line between the project and the receiving station and shall be

$$Z = [(X_1 + X_2 + X_3 + \dots) - Y / (X_1 + X_2 + X_3 + \dots)] * 100\%$$

Where

Y is the reading of the bulk energy meter installed on the 66 KV side of the receiving station  
X<sub>2</sub>, X<sub>3</sub>, X<sub>4</sub> etc are the readings of the energy meters installed at the various individual wind mill power projects being developed/proposed to be set up in the area and connected to the receiving station

**Inspection of Energy Meters:**

All main and check energy meters (export and import) and all associated instruments, transformers installed at the Project are of 0.2% accuracy class. Each meter is jointly inspected and sealed on behalf of the Parties and is not to be interfered with by either Party except in the presence of the other Party or its accredited representatives.

**Meter Test Checking:**

All main and check meters are tested for accuracy with reference to a portable standard meter. The portable standard meter is owned by KPTCL. The main and check meters shall be deemed to be working satisfactorily if the errors are within specifications for meters of 0.2 %accuracy class. The consumption registered by the main meters alone will hold good for the purpose of metering electricity supplied to the grid as long as the error in the main meters is within the permissible limits.

If during the meter test checking,

- The main meter is found to be within the permissible limit of error and the corresponding check meter is beyond the permissible limits, then the meter reading will be as per the main meter as usual. The check meter shall, however, be calibrated immediately.
- The main meter is found to be beyond permissible limits of error, but the corresponding check meter is found to be within permissible of error, then the meter reading for the month up to the date and time of such test shall be as per the check meter. There will be a revision in the meter reading for the period from the previous calibration test up to the current test based on the readings of the check meter. The main meter shall be calibrated immediately and meter reading for the period thereafter till the next monthly meter reading shall be as per the calibrated main meter.
- Both the main meters and the corresponding check meters are found to be beyond the permissible limits of error, both the main meters shall be immediately calibrated and the correction applied to the reading registered by the main meter to arrive the correct reading of energy supplied for metering electricity supplied to the grid for the period from the last month's meter reading up to the current test. Meter reading for the period thereafter till the next monthly reading shall be as per the calibrated main meter
- If during any of the monthly meter readings, the variation between the main meter and the check meter is more than the permissible limit for meters of 0.2% accuracy class, all the meters shall be re-tested and calibrated immediately.

**In case of the WEG's connected to TNEB grid the Monitoring procedure is as follows:**

- Meters (Both main and check) are installed right next to each WEG

- The Wind Energy Generator will be provided with energy meters with facilities to record export and import of energy. The meter has 0.5 % class accuracy.
- The reading of the meters shall be taken periodically by authorized officers of TNEB and representative of Suzlon, if present.
- The meters shall be tested for accuracy and shall be calibrated once in two years. Both parties shall seal the meter. Defective meters shall be replaced immediately.
- If during the annual calibrations, both the main and the check meters are found to have errors beyond permissible limits, the bill shall be revised for the previous 3 months or the exact period of know and agreed upon by both the parties, by applying corrections as determined by the meter testing wing of TNEB to the consumption registered by the meter with lesser error.
- In cases where a WEG has only the main meter installed- The O&M team checks the meters on daily basis. If the meter is found to non-functional, TNEB would be informed immediately and the meter will be replaced. Subsequent billing would happen according to the replaced meter. The generation for the intervening period would be forfeited.

#### Calibration Details

Refer attached excel sheet

## 4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

### 4.1 Baseline Emissions

#### ***Details of Baseline data:***

Data of Operating and Build Margin for the three financial years from 2006-07 to 2008-09 has been obtained from –

The CO<sub>2</sub> Baseline Database for the Indian Power Sector

**Ministry of Power: Central Electricity Authority (CEA)**

Version 5.0

Dated: November 2009

Key baseline information is reproduced in annexure 2.

The detailed excel sheet is available at:

<http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm>

Ex-ante calculation of emission reductions is equal to ex-ante calculation of baseline emissions as project emissions and leakage are nil.

Baseline emission factor (Combined Margin) (EF<sub>grid</sub>, CM, y)

= 0.9448 tCO<sub>2</sub>e/MWh

Annual electricity supplied to the grid by the Project (EGPJ,y)  
 = 158,298.184 MWh  
 Annual Baseline Emissions Reduction:  $ER_y = EF_{grid, CM, y} * EGPJ,y$   
 = 0.9448 tCO<sub>2</sub>e/MWh x 158,298.184MWh  
 = **149,560 tCO<sub>2</sub>e**

#### 4.2 Project Emissions

The project activity is a Greenfield wind power project and hence does not emit any carbon emissions.

#### 4.3 Leakage

There are no leakage emissions from the project.

#### 4.4 Summary of GHG Emission Reductions and Removals

Ex-ante calculation of emission reductions is equal to ex-ante calculation of baseline emissions as project emissions and leakage are nil.

Baseline emission factor (Combined Margin) ( $EF_{grid, CM, y}$ )  
 = 0.9448 tCO<sub>2</sub>e/MWh  
 Annual electricity supplied to the grid by the Project (EGPJ,y)  
 = 158,298.184 MWh  
 Annual Baseline Emissions Reduction:  $ER_y = EF_{grid, CM, y} * EGPJ,y$   
 = 0.9448 tCO<sub>2</sub>e/MWh x 158,298.184 MWh  
 = **149,560tCO<sub>2</sub>e**

Period	Site	Total Generation	Emission Factor	Estimation of baseline emissions (tonnes of CO <sub>2</sub> e)	Estimation of project activity emissions (tonnes of CO <sub>2</sub> e)	Estimation of leakage (tonnes of CO <sub>2</sub> e)	Estimation of overall emission reductions (tonnes of CO <sub>2</sub> e)
2008	Simran - Karnataka	777143	0.9448	734	0	0	734
	Simran - Tamil Nadu	22385865	0.9448	21164	0	0	21150
	Super - Karnataka	1741103.4	0.9448	1645	0	0	1645
2009	Simran - Karnataka	10457999.04	0.9448	9881	0	0	9881
	Simran - Tamil Nadu	33515211	0.9448	31665	0	0	31665
	Super - Karnataka	23625031.82	0.9448	22321	0	0	22321

2010	Simran - Karnataka	11097189.5	0.9448	10485	0	0	10485
	Simran - Tamil Nadu	34212056.49	0.9448	32324	0	0	32324
	Super - Karnataka	20486585.38	0.9448	19356	0	0	19355
		<b>158298184.6</b>	Total	149560	0	0	<b>149560</b>

5 ADDITIONAL INFORMATION

Corrections factors (maximum of accuracy class and error identified during the testing) have been applied to account for the non-calibration of the meters as per the frequency mentioned in the registered PD. The following table summarizes the applicable period and the correction.

WEG ID No.	HTS C no	Commissioning Date	Meter Make	Type	SI No.	Class	Fixed on	Valid till	Test Result	Test 1	Valid till	Test Result	Applicable period of correction	Applicable correction
H-29	NA	30-Sep-08	L&T	Main	6760723	0.20%	30-Sep-08	30-Sep-09	Satisfactory	11-Jan-11	11-Jan-12	Satisfactory	October 2009-December 2010	0.20%
			L&T	Check	7041036	0.20%	30-Sep-08	30-Sep-09	Satisfactory	13-Jan-11	13-Jan-12	Satisfactory	NA	NA
H-34	NA	30-Sep-08	L&T	Main	7041049	0.20%	30-Sep-08	30-Sep-09	Satisfactory	11-Jan-11	11-Jan-12	Satisfactory	October 2009-December 2010	0.20%
			L&T	Check	7041050	0.20%	30-Sep-08	30-Sep-09	Satisfactory	13-Jan-11	13-Jan-12	Satisfactory	NA	NA
K-75	NA	31-Dec-08	L&T	Main	8001330	0.20%	31-Dec-08	31-Dec-09	Satisfactory	20-Jun-10	20-Jun-11	Satisfactory	January 2010-June 2010	0.20%
			L&T	Check	8001331	0.20%	31-Dec-08	31-Dec-09	Satisfactory	20-Jun-10	20-Jun-11	Satisfactory	NA	NA
K-76	NA	5-Feb-09	L&T	Main	8001334	0.20%	5-Feb-09	5-Feb-10	Satisfactory	20-Jun-10	20-Jun-11	Satisfactory	February 2010-June 2010	0.20%
			L&T	Check	8001333	0.20%	5-Feb-09	5-Feb-10	Satisfactory	20-Jun-10	20-Jun-11	Satisfactory	NA	NA
E767	D171	30-Sep-08	Elster	Main	4954907	0.50%	30-Sep-08	30-Sep-10	Satisfactory	26-Apr-11	26-Apr-13	Satisfactory	October 2010-December 2010	0.50%
E777	D156	28-Jul-08	Elster	Main	4954363	0.50%	28-Jul-08	28-Jul-10	Satisfactory	26-Apr-11	26-Apr-13	Satisfactory	July 2010-December 2010	0.50%
			Elster	Check	4954306	0.50%	28-Jul-08	28-Jul-10	Satisfactory	26-Apr-11	26-Apr-13	Satisfactory	NA	NA
E778	D170	30-Sep-08	Elster	Main	4954892	0.50%	30-Sep-08	30-Sep-10	Satisfactory	26-Apr-11	26-Apr-13	Satisfactory	October 2010-December 2010	0.50%
E779	D155	28-Jul-08	Elster	Main	4954702	0.50%	28-Jul-08	28-Jul-10	Satisfactory	26-Apr-11	26-Apr-13	Satisfactory	July 2010-December 2010	0.50%
			Elster	Check	4954	0.50%	28-Jul-	28-Jul-	Satisf	26-Apr-	26-Apr-	Satisfact	NA	NA

				k	703	%	08	10	actory	11	13	ory		
E780	D 154	28-Jul-08	Elster	Main	4954	0.50	28-Jul-08	28-Jul-10	Satisfactory	26-Apr-11	26-Apr-13	Satisfactory	July 2010-December 2010	0.50%
			Elster	Check	4954	0.50	28-Jul-08	28-Jul-10	Satisfactory	26-Apr-11	26-Apr-13	Satisfactory	NA	NA
E781	D 157	28-Jul-08	Elster	Main	4954	0.50	28-Jul-08	28-Jul-10	Satisfactory	26-Apr-11	26-Apr-13	Satisfactory	July 2010-December 2010	0.50%
			Elster	Check	4954	0.50	28-Jul-08	28-Jul-10	Satisfactory	26-Apr-11	26-Apr-13	Satisfactory	NA	NA
E782	D 158	5-Aug-08	Elster	Main	4954	0.50	5-Aug-08	5-Aug-10	Satisfactory	26-Apr-11	26-Apr-13	Satisfactory	August 2010-December 2010	0.50%
			Elster	Check	4954	0.50	5-Aug-08	5-Aug-10	Satisfactory	26-Apr-11	26-Apr-13	Satisfactory	NA	NA
E797	765	28-Sep-08	Elster	Main	4901	0.50	28-Sep-08	28-Sep-10	Satisfactory	7-May-11	7-May-13	Satisfactory	September 2010-December 2010	0.50%
E86	754	1-Sep-08	Elster	Main	4954	0.50	1-Sep-08	1-Sep-10	Satisfactory	7-May-11	7-May-13	Satisfactory	September 2010-December 2010	0.50%
G-557	D 146	31-Mar-08	Elster	Main	4940	0.50	31-Mar-08	31-Mar-10	Satisfactory	26-Apr-11	26-Apr-13	Satisfactory	March 2010-December 2010	0.50%
			Elster	Check	4940	0.50	31-Mar-08	31-Mar-10	Satisfactory	26-Apr-11	26-Apr-13	Satisfactory	NA	NA
G-970	1529	31-Mar-08	Elster	Main	4940	0.50	31-Mar-08	31-Mar-10	Satisfactory	28-Apr-11	28-Apr-13	Satisfactory	March 2010-December 2010	0.50%
			Elster	Check	4940	0.50	31-Mar-08	31-Mar-10	Satisfactory	28-Apr-11	28-Apr-13	Satisfactory	NA	NA
Q-48	708	30-Mar-08	Elster	Main	4901	0.50	30-Mar-08	30-Mar-10	Satisfactory	7-May-11	7-May-13	Satisfactory	March 2010-December 2010	0.50%
			Elster	Check	4940	0.50	30-Mar-08	30-Mar-10	Satisfactory	7-May-11	7-May-13	Satisfactory	NA	NA
Q-51	707	31-Mar-08	Elster	Main	4901	0.50	31-Mar-08	31-Mar-10	Satisfactory	7-May-11	7-May-13	Satisfactory	March 2010-December 2010	0.50%
Q-199	1533	31-Mar-08	Elster	Main	4901	0.50	31-Mar-08	31-Mar-10	Satisfactory	3-May-11	3-May-13	Satisfactory	March 2010-December 2010	0.50%
			Elster	Check	4940	0.50	31-Mar-08	31-Mar-10	Satisfactory	3-May-11	3-May-13	Satisfactory	March 2010-December 2010	NA
Q-220	1535	31-Mar-08	Elster	Main	4901	0.50	31-Mar-08	31-Mar-10	Satisfactory	3-May-11	3-May-13	Satisfactory	March 2010-December 2010	0.50%
			Elster	Check	4940	0.50	31-Mar-08	31-Mar-10	Satisfactory	3-May-11	3-May-13	Satisfactory	NA	NA

Q-394	1525	30-Mar-08	Elster	Main	4940	0.50	30-Mar-08	30-Mar-10	Satisfactory	3-May-11	3-May-13	Satisfactory	March 2010-December 2010	0.50%
			Elster	Check	4901	0.50	30-Mar-08	30-Mar-10	Satisfactory	3-May-11	3-May-13	Satisfactory	NA	NA
K-342	NA	31-Dec-08	L&T	Main	7041	0.20	31-Dec-08	31-Dec-09	Satisfactory	19-Nov-10	19-Nov-11	Satisfactory	NA	0.20%
			L&T	Check	7041	0.20	31-Dec-08	31-Dec-09	Satisfactory	19-Nov-10	19-Nov-11	Satisfactory	NA	NA
K-345	NA	31-Dec-08	L&T	Main	7041	0.20	31-Dec-08	31-Dec-09	Satisfactory	20-Nov-10	20-Nov-11	Satisfactory	January 2010-November 2010	0.20%
			L&T	Check	7041	0.20	31-Dec-08	31-Dec-09	Satisfactory	20-Nov-10	20-Nov-11	Satisfactory	NA	NA
K-346	NA	30-Sep-08	L&T	Main	7041	0.20	30-Sep-08	30-Sep-09	Satisfactory	20-Nov-10	20-Nov-11	Satisfactory	October 2009-November 2010	0.20%
			L&T	Check	7041	0.20	30-Sep-08	30-Sep-09	Satisfactory	20-Nov-10	20-Nov-11	Satisfactory	NA	NA
K-347	NA	31-Dec-08	L&T	Main	7041	0.20	31-Dec-08	31-Dec-09	Satisfactory	20-Nov-10	20-Nov-11	Satisfactory	January 2010-November 2010	0.20%
			L&T	Check	8001	0.20	31-Dec-08	31-Dec-09	Satisfactory	20-Nov-10	20-Nov-11	Satisfactory	NA	NA
K-350	NA	30-Sep-08	L&T	Main	7041	0.20	30-Sep-08	30-Sep-09	Satisfactory	20-Nov-10	20-Nov-11	Satisfactory	October 2009-November 2010	0.20%
			L&T	Check	7041	0.20	30-Sep-08	30-Sep-09	Satisfactory	20-Nov-10	20-Nov-11	Satisfactory	NA	NA
K-69	NA	30-Sep-08	L&T	Main	7341	0.20	30-Sep-08	30-Sep-09	Satisfactory	18-Jun-10	18-Jun-11	Satisfactory	October 2009-June 2010	0.20%
			L&T	Check	7341	0.20	30-Sep-08	30-Sep-09	Satisfactory	18-Jun-10	18-Jun-11	Satisfactory	NA	NA
K-70	NA	30-Sep-08	L&T	Main	7341	0.20	30-Sep-08	30-Sep-09	Satisfactory	18-Jun-10	18-Jun-11	Satisfactory	October 2009-June 2010	0.20%
			L&T	Check	7341	0.20	30-Sep-08	30-Sep-09	Satisfactory	18-Jun-10	18-Jun-11	Satisfactory	NA	NA
K-71	NA	30-Sep-08	L&T	Main	7341	0.20	30-Sep-08	30-Sep-09	Satisfactory	19-Jun-10	19-Jun-11	Satisfactory	October 2009-June 2010	0.20%
			L&T	Check	7341	0.20	30-Sep-08	30-Sep-09	Satisfactory	19-Jun-10	19-Jun-11	Satisfactory	NA	NA