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ENVIRONMENTAL AUDIT REPORT

ENVIRONMENTAL COMPLIANCE MONITORING OF MUZAFFARGARH THERMAL POWER STATION

VISIT 03

March 2013

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ENVIRONMENTAL COMPLIANCE MONITORING OF MUZAFFARGARH THERMAL POWER STATION

Visit-03

Submission Date: March 15, 2013

Contract No: AID-EPP-I-00-03-00004
Order No: AID-391-TO-12-00002

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Exhibits

Acronym

AEAI	Advanced Engineering Associates International, Inc
CEO	Chief executive Officer
CRRW	Chief Resident Representative WAPDA
EMMP	Environmental Monitoring and Mitigation Plan
FARA	Fixed Amount Reimbursement Agreement
HBP	Hagler Bailly Pakistan
ET	EMMP Implementation Team
HSE officer	Health Safety and Environment Officer
ID	Identification number or code
MTPS	Muzaffargarh Thermal Power Station
NEQS	National Environmental Quality Standards
OHS	Occupational Health and Safety
USAID	United States Agency for International Development
WAPDA	Water and Power Development Authority

1. Introduction

The Government of United States of America through U.S. Agency for International Development (USAID) is funding Muzaffargarh repair and rehabilitation work (the 'Project'). Advanced Engineering Associates International, Inc. (AEAI) is providing monitoring and implementation support to USAID for the Project and, as part it, has acquired the services of Hagler Bailly Pakistan (HBP) to undertake environmental compliance monitoring of the Project.

The purpose of environmental compliance monitoring is to assess the performance of the implementation team of the Project at Muzaffargarh thermal power station (MTPS) (**Exhibit 1.1** and **Exhibit 1.2**) against the Environmental Monitoring and Mitigation Plan (EMMP) during the rehabilitation and repair work.

For this purpose, HBP undertook third environmental audit (the 'audit') at MTPS. The results of the audit are documented in this report.

1.1 Environmental Audit Activities

The third visit for environmental audit was undertaken on March 7, 2013.

The activities undertaken during this visit included:

- Opening Meeting with the plant management which was attended by the following:
  - Mr Abdul Karim Kumbber, Deputy Director MMS, – Muzaffargarh Thermal Power Station
  - Mr Muhammad Alyas, Additional Director, Chemical, – Muzaffargarh Thermal Power Station
  - Mr Tahir, Senior Engineer, Procurement, – Muzaffargarh Thermal Power Station
  - Mr Muhammad Akram, ARE Phase II, – Muzaffargarh Thermal Power Station
  - Mr Khalid Ali Siddiqui, ARE Phase I, – Muzaffargarh Thermal Power Station
  - Mr Manzoor Hussain, ARE Unit 4, – Muzaffargarh Thermal Power Station
  - Aziz Karim, Environmental Expert, HBP
- Walk through the plant to inspect the storage of equipment and sites, specifically where the Project activities are undertaken under FARA agreement are in progress. This included the following:
  - New arrival equipment store area where met the store keeper and observed the stored equipment and material
  - Re blading of LP turbine rotor
  - Air pre-heater elements

- ▷ ID Fan Rotor/Impeller and housings
- ▷ Cooling tower fan accessories
- ▷ Economizer tubes
- ▷ Exhaust flue gas ducts
- ▷ Waste storage yard

- ▶ General review of the existing site conditions and OHS practices
- ▶ Closing meeting with MTPS management to review the environmental documents and discuss the preliminary outcome of the audit.

1.2 Progress of Project

On the audit day, major overhauling was underway of Unit 4turbine.

A brief status of the Project as provided by AEAI and MTPS management is shown in **Exhibit 1.3**.

1.3 Environmental reporting

An effective mechanism for implementation of EMMP during the life cycle of the project is essential. The designated Environmental Team (ET) or HSE officer should prepared the EMMP related report and submit to AEAI, the project implementation unit of USAID and other stakeholder (s) on the regular basis. During the field visit, the plant management have provided latest report attached as **Appendix B1**.

1.4 Summary of the results

During the audit, old issues revisited and observations were recorded. New issues of non-compliances were also recorded where replacement and rehabilitation work was underway at the plant. Out of 11 issues from the second visit, two were addressed. The remaining issues were discussed with the management of the plant who promised to close, along with new non-compliance observations at earliest. A summary of new, pending and closed issues is presented in **Exhibit 1.4**.

1.5 Trend

The visit-wise trend is shown **Exhibit 1.5**. During the current reporting period, the trend of recorded non-compliances showed no decrease in number of non-compliances corresponding to the previous visit period. The ET of the project should take notice seriously for early closure, especially the issues pending from the first visit.

Exhibit 1.1: Project Location Map

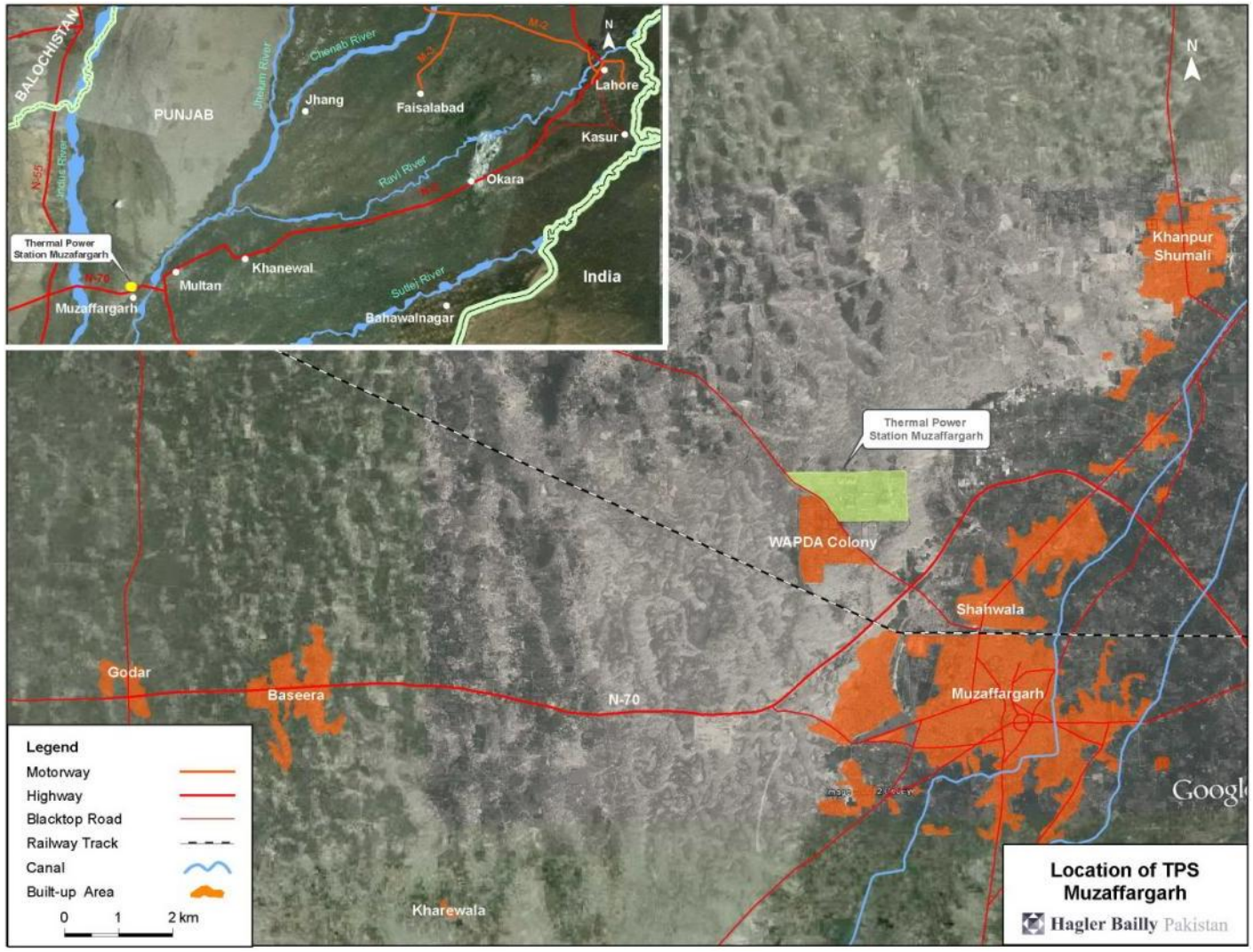


Exhibit 1.2: Satellite Image of the Plant

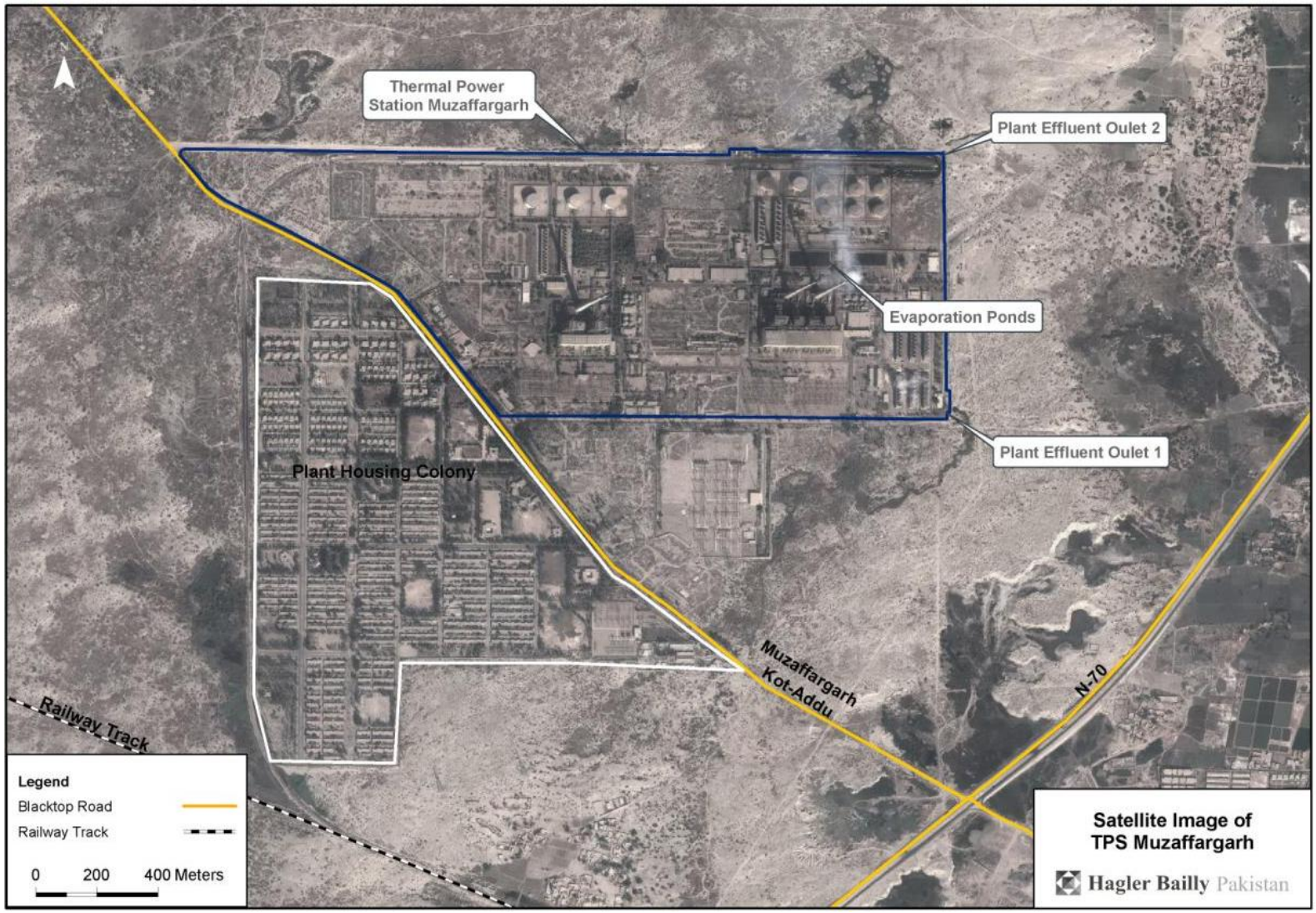


Exhibit 1.3: Progress of the Project

Line Item No.	*Unit No*	*Work Item description*	*Present Status*
1	1,2&3	Rehabilitation of boiler super heater tubes to overcome failure of tubes	Items received and installed. Waste (including iron (20,000kg), plastic and packaging) generated from the activity has been stored in the yard until disposal (as per **EMMP Ref: Exhibit 4.1**) to be finalized by the plant management.
2	1 to 4	Special Cooling Water Treatment.	Procurement under process
3	1 to 6	Use of Fuel Oil Additive as done on Unit-4 (450 Tons).	Procurement under process
4	1,2&3	Replacement of Cold layer element for RAH (2 sets)	Items received and installed Waste (including Iron (528 no.), cotton and plastic(200kg) and packaging) generated from the activity has been stored in the yard until disposal (as per **EMMP Ref: Exhibit 4.1**) to be finalized by the plant management.
5	1,2&3	Modification of Excitation system (3 set)	Procurement under process
6	1,2&3	Electric motors for C.T. Fan (02 No) and for GRC fan. (01 No).	Procurement under process
7	3	D.C. Storage batteries (01 Set).	Items received and installed. Waste (including packaging, wooden and plastic) generated from the activity has been stored in the yard until final disposal (as per **EMMP Ref: Exhibit 4.1**) to be finalized. Battery waste has been auctioned and disposed off as per procedure of the plant (see **Appendix E**)..
8	1,2&3	220Kv circuit breaker SF6 type (06 No).	Procurement under process
9	4	Re-blading of LP. Rotor (LP Turbine Rotor blades of row (6&7), pins & locking device).	Items received and installation is in progress
10	4	Air Pre-Heater Elements (Intermediate and Cold) 02 sets	Items received and installed. Waste (including iron, cotton and plastic, and packaging) generated from the activity has been stored in the yard until disposal (as per **EMMP Ref: Exhibit 4.1**) to be finalized by the plant management.
11	4	Up-gradation of AVR System (01 set).	Procurement under process

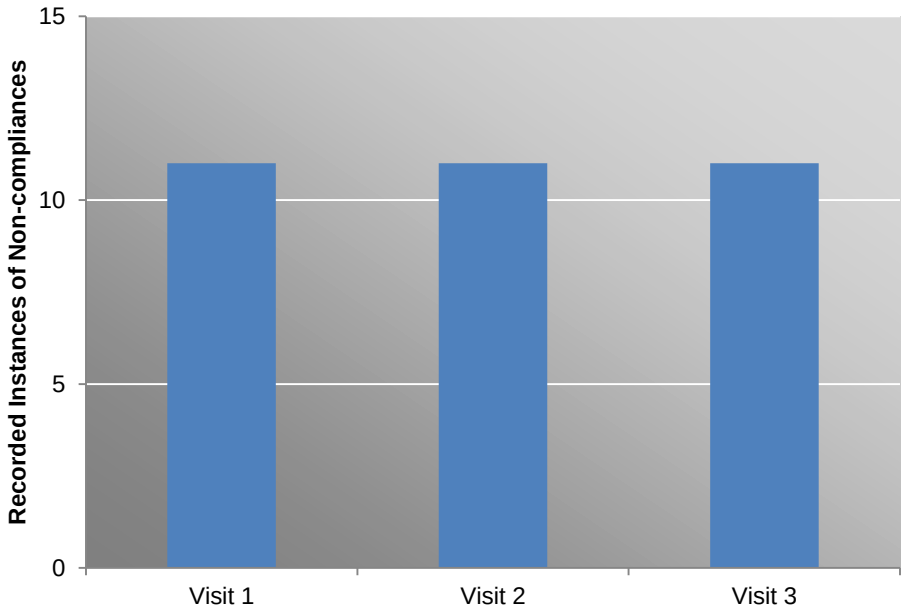
Line Item No.	*Unit No*	*Work Item description*	*Present Status*
12	4	Changing of UPS 1&2. (01 set).	Procurement under process
13	4	DEH (01 set).	Procurement under process
14	4	Up-gradation of FSSS System (01 set).	Procurement under process
15	4	Up-gradation of TSI system BNC 3300 or equivalent (Turbine Supervisory Instrument) (01 set).	Procurement under process
16	1-6	Training and software/hardware cost for CMMS and off-line efficiency monitoring system. All Units	Procurement under process
17	5&6	I.D. Fan Rotor/Impeller along with Housing and Dampers (04 Set).	Items received at Plant and replacement work is underway. Waste generating during the work is temporarily stored on the ground then shift to the yard until disposal (as per **EMMP Ref: Exhibit 4.1**) to be finalized by the plant management
18	5&6	Air Pre heater Elements Hot end, intermediate & cold end layers along with seals for both units (04 Set).	Items partially received. Hot end elements received
19	5&6	Procurement of G.R.C. Fan Impeller/Rotor (01 Set).	Items received at Plant and to be installed
20	5&6	Procurement of Cooling Tower Fan Gear Box & its parts. (06 No. gear box).	Items received at Plant and partially installed
21	5&6	Economizer Tubes for both Units (02 Sets)	Items received at the plant and to be installed
22	5&6	IP Turbine Rotor (01 No).	Procurement under process
23	5&6	Replacement of Damaged Exhaust flue gas ducts of material Russian Grade Steel sheets (50 M.T), Plate Type Heat Exchanger for Inner Water Cooling System of Generator and Motor for Starting Oil Pump (Vertical) Units 5-6	Items received at Plant and partially installed
24	5&6	Conversion of Boiler Ignition System from	Procurement under process

Line Item No.	*Unit No*	*Work Item description*	*Present Status*
		Natural Gas to HSD/Furnace Oil	
25	5&6	Repair of winding and stator of Generators and testing	Procurement under process
26	5&6	Hydraulic coupling of Boiler Feed Water Pumps (01 No).	Procurement under process
27	5&6	Modification of Excitation System	Procurement under process
28	5&6	Procurement of 0.4KV Motors for Cooling Towers Fan and APH 02	Items received at Plant and partially installed
29	5&6	Procurement of 6.6KV Motor for C.W. Pumps, CP, ID Fan, FD Fan & BF Pumps (05 No).	Items received at the plant and to be installed
30	5&6	Procurement of 6.6/0.4KV Breaker (5 No. 6KV breaker, 18Nos. 0.4Kv Breakers).	Items received at the plant and to be installed
31	5&6	Protection Relay for Generators.	Procurement under process
32	5&6	MK Breakers, Seal Oil Coolers, PMG	Items received at Plant and partially installed
33	5&6	Supply, Installation, Commissioning & Testing of complete distributed control system (DCS) including field equipment like sensors, transmitter & actuators etc. for turbine governing system DEH-III and Boiler Turbine Auto regulation system YEWPACK-II	Procurement under process
34	5&6	Rehabilitation of Furnace safety Supervisory System (FSSS) including Furnace camera, flame monitoring & ignition system	Procurement under process

Exhibit 1.4: Visit-wise Summary of Non-compliances

Visit No.	*Current Issues*	*Pending Issues*	*Total Issues*	*Issue Closed*	*Average Time Taken (Days)*	*Open Issues*
01	11	–	11	–	–	11
02	02	11	13	02	82	11
03	02	09	11	02	281	11

Exhibit 1.5: Visit-wise Trend in Recorded Non- Compliances



2. Register of Audit Observations

See **Exhibit 2.1** on following pages:

Exhibit 2.1: Register of Audit Observation

Serial Number	*Issue ID*	*Visit No.*	*Issue*	*Photographic ID*	*Date Raised*	*Proposed Corrective Action*	*Responsibility*	*Target/ Revised Target Date*	*Status*	*Verification*	*Comments*	*Addressed Date*	*Days taken to Address/ Reason of Delay*
Pending Issues from Last visits													
01	1-01	01	No evidence was available that the vehicles used for the transportation of project equipment were compliant with the national environmental quality standards (NEQs)	–	April 18, 2012	Vehicles used for the transportation are NEQS compliant for the emissions and noise (**EMMP Ref: Exhibit 4.1**)	ET	April 18, 2012 (1) October 31, 2012 (2) March 29, 2013	No progress	–	MTPS has sent letter to Chief Resident Representative Wapda, who arrange vehicles for transportation of the equipment to MTPS under FARA, to ask contractor for the compliance of vehicle with the NEQs No response received yet (see **Appendix B2**)	–	CEO waiting for the response of the letter, sent to CRRW for providing the testing results. No response received yet. HBP have suggested management to send a reminder.
02	1-03	01	Training for occupational health and safety has not been scheduled	–	April 18, 2012	Training should be scheduled as per requirement (see **EMMP Ref: Exhibit 4.2**)	ET	May 1, 2012 (1) October 31, 2012 (2) March 29, 2013	No progress	–	HBP suggested to the EMMP implementation team (ET) (see **Appendix B3**) of the project to initiate trainings of staff from basics, i.e importance and requirement of PPEs in personal safety at work site	–	No such training conducted so far.

Serial Number	*Issue ID*	*Visit No.*	*Issue*	*Photographic ID*	*Date Raised*	*Proposed Corrective Action*	*Responsibility*	*Target/ Revised Target Date*	*Status*	*Verification*	*Comments*	*Addressed Date*	*Days taken to Address/ Reason of Delay*
03	1-04	01	New equipment (such as impellers near Unit 4) were stored at non designated area in the passage way	06, 09	April 18, 2012	The new equipment shall be stored in properly demarcated and identified areas (see **EMMP Ref: Exhibit 4.1**)	ET of Unit 4	April 28, 2012 (1) October 31, 2012 (2) March 29, 2013	Open	–	Impellers still found at the time of third visit. If this place has been designated for temporary storage, then need to be properly labeled and demarcated	–	As per plant management, these are left at places for easy move to its final distination at the time of replacement work
04	1-06	01	Storage area for new equipment was not demarcated and labeled	06	April 18, 2012	Storage area will be demarcated. Area will be either marked on the floor or cordoned off by tapes (see **EMMP Ref: Exhibit 4.1**)	ET	April 25, 2012 (1) October 31, 2012 (2) March 29, 2013	No progress	–	Plant managent and ET may facilitate store keeper in arrangements	–	No such facility is available with the store keeper
05	1-07	01	Packing material waste record was not maintained and location was not known generated from Unit 1, 2 and 3	–	April 18, 2012	Inventory of all waste including packing material waste shall be prepared. For each type of waste the quantity and disposal mechanism shall be identified (see **EMMP Ref: Exhibit 4.1**)	ET	May 1, 2012 (1) October 31, 2012 (2) March 29, 2013	Open	–	For some items, generated waste amount has been recorded e.g line item no.01 and 04.	–	Inventory need to be made for each type of waste generated.

Serial Number	*Issue ID*	*Visit No.*	*Issue*	*Photographic ID*	*Date Raised*	*Proposed Corrective Action*	*Responsibility*	*Target/ Revised Target Date*	*Status*	*Verification*	*Comments*	*Addressed Date*	*Days taken to Address/ Reason of Delay*
06	1-08	01	Waste (iron, copper, packaging etc) generated from Unit 1, 2 3, 4, 5 and 6 was not segregated in waste storage area.	07, 08	April 18, 2012	In the store yard all waste shall be stored separately. No waste shall be stored within the passage way (see **EMMP Ref: Exhibit 3.2**).	ET	April 25, 2012 (1) October 31, 2012 (2) March 29, 2013	No progress	–	Waste (iron and cotton and wooden) needs to be segregated properly, stored at yard		No reason provided for not following the EMMP
07	1-09	01	Waste storage area was not demarcated and labeled.	01, 02, 03, 04	April 18, 2012	In the yard all waste shall be marked (see **EMMP Ref: Exhibit 3.2**).	ET	April 25, 2012 (1) October 31, 2012 (2) March 29, 2013	No progress	–	Plant managent needs to facilitate yard personnel	–	No such facility is available with the personnel at the yard
08	1-11	01	Final disposal of waste(iron, copper, packaging etc) has not been scheduled	–	April 18, 2012	The different types of waste should be timely disposed in accordance with the procedure mentioned in **section 3 of EMMP**	ET	May 1, 2012 (1) October 31, 2012 (2) March 29, 2013	No progress	–	Disposal of non-valued waste such as used cotton, plastic packages and other, needed to be disposed off appropriately.	–	The plant management waiting for all replacement work to be completed for one time disposal

Serial Number	*Issue ID*	*Visit No.*	*Issue*	*Photographic ID*	*Date Raised*	*Proposed Corrective Action*	*Responsibility*	*Target/ Revised Target Date*	*Status*	*Verification*	*Comments*	*Addressed Date*	*Days taken to Address/ Reason of Delay*
09	2-01	02	Iron waste stored in yard is not properly marked.	01, 02, 03, 04	September 19, 2012	In the store yard all waste shall be properly marked and segregated. A clear passage way marked by lines on the ground shall be left for walking of staff. No waste shall be stored within the passage way (**EMMP Ref: 3.2**).	ET	October 31, 2012	No progress	–	Yard management personnel need to train on waste management so any waste that generated from the project activities should be documented, demarcated and labeled	–	Untrained yard personnel

Serial Number	*Issue ID*	*Visit No.*	*Issue*	*Photographic ID*	*Date Raised*	*Proposed Corrective Action*	*Responsibility*	*Target/ Revised Target Date*	*Status*	*Verification*	*Comments*	*Addressed Date*	*Days taken to Address/ Reason of Delay*
New Issues from Recent Visit													
10	3-01	03	Personal protection equipment (PPEs) was not used by the workers appropriately noticed duriing major overhauling work of Unit 4 turbine	10	March 7, 2013	Appropriate PPE shall be provided to the workers and it shall be ensured that the PPE are used. (**EMMP Ref: 4.1**). All the staff of the project should be trained to use PPE. Record of all training shall be maintained (**EMMP Ref: Exhibit 4.1**)	ET of Unit 4	Immidiate	–	–	PPEs need to be available for each worker	–	Complete PPEs were not available to some workers
11	3-02	03	Removed cooling tower fans and gear box from Unit 5 and 6 were found at undisignated area	05, 08	March 7, 2013	After dismantling, all parts and machines shall be dispatched from site to storage yard as soon as possible, preferably on the same day (**EMMP Ref: Exhibit 3.2**)	ET of Unit 5&6	March 29, 2013	Open	–	Removed items shall be stored in designated area with proper label and demarcation	–	–
Issues Closed													

Serial Number	*Issue ID*	*Visit No.*	*Issue*	*Photographic ID*	*Date Raised*	*Proposed Corrective Action*	*Responsibility*	*Target/ Revised Target Date*	*Status*	*Verification*	*Comments*	*Addressed Date*	*Days taken to Address/ Reason of Delay*
12	1-02	01	MTPS has not formulated any environmental team to implement EMMP	–	April 18, 2012	Environmental team will be designated at each unit and their job description will be documented (**EMMP Ref: section 4.5**).	CEO and HSE officer	September 27, 2012	Closed	Yes	An environmental team has formed for each unit for implementation of EMMP (see **Appendix B4**)	September 25, 2012	160
13	1-05	01	After the machines or equipment were used packing material waste from storage area was thrown at different places	05	April 18, 2012	All type of waste shall be collected and stored in separate bins marked for this purpose **EMMP Ref: Exhibit 3.2**)	DD (MMS)	April 25, 2012	Closed	Yes	Removed and shifted to yard	April 25, 2012	05
14	1-10	01	No safety measures were taken in storage of the Lead acid batteries	–	April 18, 2012	Proper safety measures should be taken while handling, storage and disposal of these batteries as they contain toxic material (**EMMP. Ref: 3.2**) It is recommended that the batteries should be stored in shed areas away from direct sunlight and rain with impervious floor).	ET	July, 2012 (1) October 31, 2012	Batteries were auctioned as per WAPDA protocols.	Yes	Batteries were auctioned as per WAPDA protocols. The management has provided documentary evidence of final disposal (see **Appendix B5**)	March 7, 2013	324

Serial Number	*Issue ID*	*Visit No.*	*Issue*	*Photographic ID*	*Date Raised*	*Proposed Corrective Action*	*Responsibility*	*Target/ Revised Target Date*	*Status*	*Verification*	*Comments*	*Addressed Date*	*Days taken to Address/ Reason of Delay*
15	2-02	02	Quantity and final distination of Lead acid batteries to be provided	–	September 21, 2012	Inventory of all waste shall be prepared. For each type of waste the quantity and disposal mechanism shall be identified and where necessary, audit of the waste contractor (**EMMP Ref: Exhibit 4.1**) Lead and acid from theses batteries should be removed from the used battery cells (**EMMP Ref: Exhibit 3.2**) The acid may be reused or recycled **EMMP Ref: Exhibit 3.2**) Proper safety measures should be taken while handling, storage and disposal of these batteries as they contain toxic material (**EMMP Ref: Exhibit 3.2**)	ET	October 31, 2012	Closed	Yes	Batteries were auctioned as per WAPDA protocols. The management has provided documentary evidence of final disposal (see **Appendix B5**)	March 7, 2013	238

3. Areas of Concern and Corrective Actions

See **Exhibit 3.1** on following page:

Exhibit 3.1: Areas of Concern and Corrective Actions

Issue	*Issue ID/ Visit No. (see **Exhibit 2.1**)*	*Monitoring Indicator(s)*	*Proposed Corrective Action in EMMP*
Vehicles used for the transportation are NEQS compliant for the emissions and noise	▶ 1-01/ 01	Results of the noise and emissions	▶ Vehicles used for the transportation shall be monitored for the emissions and noise (**EMMP Ref: Exhibit 4.1**).
Trainings on occupational health and safety	▶ 1-03/ 01 ▶ 3-02/ 03	Documentation record and walk through audit observations	▶ Appropriate PPE shall be provided to the workers and it shall be ensured that the PPE are used (**EMMP Ref: Exhibit 4.1**). ▶ The staff shall be provided with training in use of PPE (**EMMP Ref: Exhibit 4.1**). ▶ Proper scaffolding platforms shall be provided for all work areas located more than 1 m above floor level (**EMMP Ref: Exhibit 4.1**). ▶ First Aid facilities and fire protection devices should be placed in areas where activates will be performed (**EMMP Ref: Exhibit 4.1**). ▶ Ear protection devise shall be used if the noise level is above 85 dB(A) (**EMMP Ref: Exhibit 4.1**).
Improper solid waste management	▶ 1-05/ 01 ▶ 1-07/ 01 ▶ 1-08/ 01 ▶ 1-09/ 01 ▶ 1-10/ 01 ▶ 1-11/ 01 ▶ 2-01/ 02 ▶ 2-02/ 02 ▶ 3-01/ 03	Quantity of waste generated, their classification and disposal mechanism	▶ Inventory of all waste shall be prepared. For each type of waste the quantity and disposal mechanism shall be identified (**EMMP Ref: Exhibit 4.1**). ▶ Where necessary, audit of the waste contractor (**EMMP Ref: Exhibit 4.1**). ▶ Implementation of waste management plan presented in **Section 3 of EMMP**.
Storage of new equipment	▶ 1-04/ 01 ▶ 1-06/ 01	Walk through audit observations	▶ The new equipment shall be stored in properly demarcated and identified areas (**EMMP Ref: Exhibit 4.1**). ▶ Separate storage of each item should be adopted and each area should be marked either on floor or cordoned off by tapes (**EMMP Ref: Exhibit 4.1**). ▶ Lifting equipment (cranes) used for the equipment shall follow the prescribed safety specification tapes (**EMMP Ref: Exhibit 4.1**). ▶ Material Safety Data Sheet (MSDS) for chemicals, if any, shall accompany the consignment. A copy of the MSDS shall be available near the storage area at all times tapes (**EMMP Ref: Exhibit 4.1**).

4. Waste Inventory and Disposal Record

As part of the EMMP, an inventory of the waste generated during the rehabilitation and repair activities is required. Inventory of various wastes generated during the rehabilitation project is listed in **Exhibit 4.1**. However, the data in the table is taken from the EMMP (except the data for line item no. 1 and 4, which was given by the plant management, **Appendix B5**) and provided only to indicate the relative magnitude of the generated waste. The ultimate disposal of the waste is to be provided by the management of the plant.

Exhibit 4.1: Waste Inventory and Disposal Record

Line Item No.	*Estimated Generated Waste*															
	Solid														*Liquid*	
	Steel/ Iron (kg)	*Disposal Status*	*Copper (kg)*	*Disposal Status*	*Wool (kg)*	*Disposal Status*	*Battries (No.)(kg)*	*Disposal Status*	*Plastic, Wood, Cloth & Packaging (kg)*	*Disposal Status*	*Electronics (kg)*	*Disposal Status*	*Soot (kg)*	*Disposal Status*	*Oil (liters)*	*Disposal Status*
1	20,000	Kept in yard	–	–	–	–	–	–	50	–	–	–	–	–	–	–
2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
3	40	–	–	–	–	–	–	–	800	–	–	–	–	–	–	–
4	250 no. Weight: ??	Kept in yard	–	–	–	–	–	–	200	Kept in yard	–	–	–	–	–	–
5	–	-	–	–	–	–	–	–	–	–	–	–	–	–	–	–
6	300	–	20	–	–	–	–	–	50	–	–	–	–	–	–	–
7	–	–	–	–	–	–	130	–	400	–	–	–	–	–	–	–
8	10	-	50	–	–	–	–	–	100	–	–	–	–	–	–	–
9	1,500	-	–	–	–	–	–	–	100	–	–	–	–	–	–	–
10	100	–	20	–	–	–	–	–	50	–	–	–	–	–	–	–
11	50	–	100	–	–	–	–	–	–	–	600	–	–	–	–	–
12	100	-	100	–	–	–	12	–	–	–	250	–	–	–	–	–
13	–	-	–	–	–	–	–	–	–	–	–	–	–	–	–	–
14	–	-	–	–	–	–	–	–	–	–	–	–	–	–	–	–
15	–	-	–	–	–	–	–	–	–	–	–	–	–	–	–	–
16	–	–	50	–	–	–	–	–	100	–	500	–	–	–	–	–

Line Item No.	Estimated Generated Waste															
	Solid														Liquid	
	Steel/ Iron (kg)	Disposal Status	Copper (kg)	Disposal Status	Wool (kg)	Disposal Status	Battries (No.)(kg)	Disposal Status	Plastic, Wood, Cloth & Packaging (kg)	Disposal Status	Electronics (kg)	Disposal Status	Soot (kg)	Disposal Status	Oil (liters)	Disposal Status
17	800	–	50	–	–	–	–	–	50	–	–	–	–	–	–	–
18	300	–	–	–	–	–	–	–	50	–	–	–	–	–	–	–
19	10,000	–	500	–	–	–	–	–	100	–	–	–	–	–	–	–
20	4,500	–	100	–	–	–	–	–	100	–	–	–	–	–	–	–
21	200	–	–	–	–	–	–	–	50	–	–	–	–	–	–	–
22	800	–	–	–	–	–	–	–	50	–	–	–	–	–	–	–
23	170,000	–	–	–	–	–	–	–	800	–	–	–	3000	–	–	–
24	100	–	–	–	–	–	–	–	50	–	–	–	–	–	–	–
25	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
26	2,000	–	50	–	–	–	–	–	50	–	–	–	–	–	–	–
27	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
28	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
29	10,000	–	100	–	–	–	–	–	100	–	–	–	–	–	–	–
30	100	–	10	–	–	–	–	–	50	–	–	–	–	–	–	–
31	1,000	–	50	–	–	–	–	–	50	–	–	–	–	–	–	–
32	2,500	–	500	–	–	–	–	–	100	–	–	–	–	–	–	–
33	20	–	300	–	–	–	–	–	100	–	1,000	–	–	–	–	–

Appendix A: Photographs

Photograph 01: Iron waste from Unit 5&6 stored in yard is not properly marked.

Photograph 02: Iron waste from Unit 5&6 stored in yard is not properly marked.

Photograph 03: Iron waste from Unit 4 stored in yard is not properly marked.

Photograph 04: Wooden waste from new items of Unit 4stored in yard is not properly marked.

Photograph 05: Removed cooling tower fans of unit 5&6 placed at undesignated area

Photograph 06: FARA item for Unit 4 stored at non designated area

Photograph 07: Different waste from Unit 5&6 without proper segregation

Photograph 08: Removed gear box of Unit 5&6 placed at undesignated area

Photograph 09: FARA item of Unit 5&6 stored in godown without clearly marked

Photograph 10: Staff without proper PPEs working on major overhauling of turbine of Unit 4

Appendix B: Reference Documents

See following pages:

Appendix B1: Environmental Report by Plant EMMP Implimentation Team (ET) of MTPS

(see folloowing pages)

NORTHERN POWER GENERATION COMPANY LIMITED

TeleNo. 066-9200296

Fax No. 066-9200166

Office Of The
Chief Executive Officer
Genco-III, NPGCL, TPS,
Muzaffargarh

No. CEO/MZG/Dir (MMS)/2531-33

Dated 07/03/2013

Head of Project Implementation Unit,
USAID GTIP Project,
AEAI, Islamabad.

Subject: **IMPLEMENTATION OF ENVIRONMENTAL MITIGATION & MONITORING PLAN (EMMP) FOR REPAIR AND REHABILITATION WORK AT MUZAFFARGARH THERMAL POWER STATION.**

It is hereby intimated please that, as per Waste Disposal Plan, proper Handling/Storage of equipment and consequent waste produced hereafter installation, is being ensured.

Further Block wise progress report for the period from May 2012 to Feb-2013, on the prescribed proforma, by collecting all data relating to procurement/installation and consequent waste generation, as instructed in the EMMP Plan is prepared and is hereby being attached for your information as desired please.

Chief Engineer/Technical Director
NPGCL, TPS Muzaffargarh

DA/Progress Report

C.C To:
- Mr. Aziz Khan Manager Environment Technology Hagler Bailly Pakistan.
- PA to CEO TPS Muzaffargarh.

Appendix B2: Letter to CRRW

NORTHERN POWER GENERATION COMPANY LIMITED

TeleNo. 066-9200296

Fax No. 066-9200166

Office Of The
Chief Executive Officer
Genco-III, NPGCL, TPS,
Muzaffargarh

No. CEO/MZG/Dir (MMS)/4134-36

Dated. 18 / 04/2012

The Chief Resident Representative,
39-C Block-6 P.E.C.H.S
Karachi

Subject: **IMPLEMENTATION OF ENVIRONMENTAL MITIGATION & MONITORING PLAN (EMMP) FOR REPAIR AND REHABILITATION WORK AT MUZAFFARGARH THERMAL POWER STATION.**

As per Environmental Mitigation and Monitoring plan (EMMP) for repair and rehabilitation work at TPS Muzaffargarh under FARA submitted by USAID GTIP project's head, it is to ensure that, all the repair and rehabilitation works under FARA agreement are to be environmentally compliant in accordance with the applicable USG and Government of Pakistan Policies and regulations.

In this scenario, it is hereby desired that all the vehicles used for the transportation of Material/Equipment from Karachi to Thermal Power Station Muzaffargarh, covered under USAID Programme, must be National Environmental Quality Standards (NEQS) Compliant for the emissions and noise.

Chief Executive Officer
(Genco-III) NPGCL
TPS, Muzaffargarh

c.c.to:-

- Chief Engineer/Technical Director TPS Muzaffaragrh.
- Mr. Hassan Ahmed Auditor Hagler Bailly Pakistan.

Appendix B4: EMMP Implimentation Team of MTPS
(see folloowing pages)

Northern Power Generation Company Limited

(A Subsidiary of Pakistan Electric Power Company)

Ph: No. 066/9200286
066/2512296
Fax No. 066/9200186

Office of the
Chief Executive Officer
GENCO-III, TPS, Muzaffargarh

No. CEO/TPS/MZG/RE-I/ARE (M)-22/ 3495-99 Dated: 04 / 05 /2012

Office Order

Following committee is hereby constituted for the monitoring and inspection of the works being carried out under US AID Programme.

01) Rasheed Ahmad Bhatti	Senior Engineer (I&C)	Convener
02) Assistant Engineer	Concerned Section	Member
03) Assistant Store Manager	Phase-I	Member

Resident Engineer (O&M)-I,
Genco-III, TPS, Muzaffargarh

C.C:-

- Director MMS, Thermal Power Station, Muzaffargarh.
- Assistant Resident Engineer (M), Phase-I, TPS, Muzaffargarh.
- Master File.

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PEPCO

NORTHERN POWER GENERATION COMPANY LTD.

Phone: 066 – 9200295, 066-9200165
066 – 9200285
PBX. 066-9200151-152, 153, 154
Fax: 066 – 9200185

OFFICE OF THE
CHIEF EXECUTIVE OFFICER,
NPGCL, (GENCO-III) T.P.S.
MUZAFFARGARH.

No. CEO / MZG / RE-4 / 3931-37 Dated. 7-5. 2012

OFFICE ORDER

In accordance with CEO Office Letter No.CEO/MZG/Dir(MMS)/4137-41 dated:18.04.2012. A committee comprising of following Members is hereby constituted to implement Environment Mitigation & Monitoring Plan (EMMP) for repair and rehabilitation work unit-4 at Thermal Power Station, Muzaffargarh.

1.	Mr. Mansoor Hussain Asstt:Resident Engineer(M)Unit-4	Health & Safety Executive
2.	Mr.Muhammad Aslam Anjum Asstt:Mech.Engineer(Unit-4)	Member
3.	Mr.Muhammad Shahzad Asstt:Inst.Engineer (Unit-4)	Member
4.	Mr.Azeem Abbasi Asstt:Elect.Engineer	Member
5.	Mr.Muhammad Usman Asstt:Store Manager	Member

Resident Engineer (O&M)
Unit-4, TPS, Muzaffargarh

C.C.

1. The Chief Engineer/Technical Director, NPGCL, TPS, Muzaffargarh.
2. The Dy.Director(MMS), NPGCL, TPS, Muzaffargarh.
3. Officer Concerned.

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(5)

PEPCO

Northern Power Generation Company Limited
Thermal Power Station, Muzaffargarh
Phone: 066-9200292 Fax: 066-9200160

Chief Executive Officer

No. CEO/MZG/RE-II/U-5&6/AREM/ 3181 Dated. 10 /05/2012

OFFICE ORDER

In compliance with Chief Executive Officer, Genco-III,TPS Muzaffargarh letter No.CEO/MZG/Dir(MMS)/4137-41 dated 18-04-2012, undersigned is pleased to constitute a Committee of the following officers to implementation of Environmental Mitigation & Monitoring Plan (EMMP) for repair and rehabilitation work at Units 5&6 TPS Muzaffargarh covered under USAID(FARA) for proper handling/storage of equipment and consequent waste produced hereafter installation as per waste disposal plan.

01-	Sr. Engineer (I&C)	Convener
02-	Jr. Engineer (Mech.)	Member
03-	Jr. Engineer (Elect.)	Member
04-	ASM Units 5&6	Member

RESIDENT ENGINEER(O&M)
TPS UNITS 5&6 MUZAFFARGARH

cc.

- CE/TD. TPS Muzaffargarh.
- Dy. Director, MMS TPS Muzaffargarh.
- ARE(M), Units 5&6 TPS Muzaffargarh
- All concerned.

Nadir*/

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Appendix B5: Waste Inventory and Disposal Report

(see following pages)

SURVEY REPORT

The survey report of the following Un-wanted material has been prepared and is being submitted which may kindly be passed on to the Dir:(Tech:) Conveners of the Survey committee for further necessary action please.

Sr. No	Survey Report No	Description.	Qty	Remarks.
01	289	M.S Scrap of Super Heater Tubes	20000 Kg.	

Submitted for further necessary action please.

Assistant Store Manager-I
TPS, Muzaffargarh.

A.R.E (M)-I 3/2/12

R.E. (O&M)-I 03/02/12

D. Tech.

PAKISTAN WATER AND POWER DEVELOPMENT AUTHORITY

ELECTRICITY DEPARTMENT

STORES CHALLAN

No. 213 Dated 08-5-12

From CEO NPGCL GENCO III TPS M/Garh To Mr. Khalid Mehmood

In compliance with your Indent (E. B Form C.A -1) No _____
Depot Transfer Order (E.B. Form C.A.-22) No. _____
Dated _____ the goods detailed below have been despatched to you
Dated _____
per Lorry No. _____ Name of Driver _____
Passenger/Goods Train R/R No. _____ date _____ attached.
No. of packages _____ Weight in Kg. _____

Item No.	Code No.	Brief Description of Stores	QUANTITY Uuit	QUANTITY No.	Rate	Amount	Stock Tools and Plans	Remarks
Col.	1	2	3	4	5	6	7	8
1-		Unserviceable Station Battery Scrap No 130 130 Nos/7150 kg				RELEASE ORDER NO. CEO/MZG/Admn/DISP-12/4614-51 dt: 25-4-12		
2-		Unserviceable station Battery Scrap No 53 53 Nos/5304 kgs						
3-		Unserviceable Battery Scrap (vehicle) No 194 194 Nos				Material received by 29/4/12		

Item Three only

RELEASE COMMITTEE

1- Convener: - 8/5/12
2- Member: -
3- Member: -
4- Member: -

Stores Issued by SSK date

Treasury Officer

(P.T.O.)

Sr. No.	Store Challan No	Description
1-	213	(Unserviceable Station Battery Scrap 130 No./ 7150 kgs
2-	—"—	(Unserviceable Station Battery Scrap 53 Nos / 530 kgs
3-	—"—	(Unserviceable vehical Battery Scrap

Item three Only

RELEASE COMMITTEE

1- Convener :—

2- Member :—

3- Member :—

4- Member :—

(2)

[redacted]

95028 dt. 08

4444-51 ~~3458~~98 dated 25/12

53 Nos — " — — " —

194 Nos — " — — " —

Material received by

[redacted]

نوٹ = یہ سامان سمی محمد سلیم ولد محمد اکرم نے خرید کیا تھا۔ اور بعد اُس نے سمی خالد محمود ولد
شیخ محمد سکنہ مظفر گڑھ کو بذریعہ اقرار نامہ پر یہ سامان اٹھانے کی اجازت دی ہے
اور سارا حساب بیباق کر دیا ہے۔

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