Annex 3.56 Action Plan 1 for O&M of Mechanical Equipment in Fall 2016



| Training Title:   | O & M Module 1 and Module 4 | Date of Training: | Dec.26-Dec<br>30 <sup>th</sup> , 2016 |
|-------------------|-----------------------------|-------------------|---------------------------------------|
| Name of Participa | nt: <u>Amir Tufail</u>      |                   |                                       |
| Name of Organiza  | ation: WASA Lahore          |                   |                                       |

Please list three important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on SOP, Record Keeping, Preventive maintenance and HSE*)

1.

Make a schedule of repair maintenance of the disposals&tubewells about machinery (Error) & check &balance the record on daily basis.

2.

Normally maintenance manuals & the timing of operating machinery manuals all must be available on sites.

3.

In relevant field like pumps,motors&different types of valves even chlorination &major thing is ultrafiltration plant which are the main thing of my department .Personally I learn above mention thing that how to create normally repair, their functions. Causes of their damaging much more.

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA.

| Sr.<br>No. | Action Item<br>(what)              | Responsible<br>(who) | Due Date<br>(when) | Date<br>Completed | Comments              |
|------------|------------------------------------|----------------------|--------------------|-------------------|-----------------------|
| 1          | Burn out the motor with and cause. | S.E                  | 30-12-2016         | 31-12-2016        | Due to<br>workshop    |
| 2          | Finalize the created plan          | Sub Engg<br>&SDO     | 30-12-16           | 5-1-1017          | Team not<br>available |
| 3          |                                    |                      |                    |                   |                       |
| 4          |                                    |                      |                    |                   |                       |

- 1. Laptop where I make schedule of all machinery.
- 2. Log books at all for daily check and balance.
- 3. Manuals/Printed sheets at site must.
- 4. Department permission& funds.
- 5. Good team

Please identify any barriers or hindrances to the implement this plan.

- 1. Trained workers shortage.
- 2. Latest equipment which need but not avail abled.
- 3. Bad team

#### **Other Comments or Notes:**

Due to short time of training I learn more about my relevant field my responsibilities but main things remain which I will trying to gain the knowledge a lot by training.



| Training Title:  | O & M Module 1 and Module 4 | Date of Training: | Dec.26-Dec<br>30 <sup>th</sup> , 2016 |
|------------------|-----------------------------|-------------------|---------------------------------------|
| Name of Particip | oant: Fayyaz Ahmed          |                   |                                       |
| Name of Organiz  | zation: WASA Lahore         |                   |                                       |

Please list three important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on SOP, Record Keeping, Preventive maintenance and HSE*)

1.

Scheduling of repair, maintenance and cleanliness of installations(i.e tube wells, disposal stations, filtration plants)

2.

Displaying Sop's, data sheets and schedule at all installations as well as maintain officials record

3.

Monitoring, implementation and evaluation of schedules, SOP's, manuals and plans.

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA.

| Sr.<br>No. | Action Item<br>(what)   | Responsible<br>(who)                               | Due Date<br>(when) | Date<br>Completed | Comments                       |
|------------|---|--|--------------------|-------------------|--------------------------------|
| 1          | Collecting manuals and SOP's from manufacturers.                        | SDO  | 7-1-2017           | 10-1-17           | Delayed by<br>manufacture<br>r |
| 2          | Scheduling of O&M in<br>accordance with the SOP's or<br>manuals         | SDO and<br>Sub- Engg                               | 12-1-17            | 12-1-17           |                                |
| 3          | Reviewing of plans<br>plans/drafts and displaying for<br>implementation | SDO and<br>Sub- Engg,<br>Supervisor ,O<br>perators | 15-1-17            | 20-1-17           | Team not<br>available          |
| 4          |   | -  |                    |                   |                                |

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|     |  |  |  |
|     |  |  |  |

- 1. Computer system/laptop
- 2. Departmental permission/funding
- 3.Work force
- 4.Printed sheets
- 5. Log books/work space etc.

Please identify any barriers or hindrances to the implement this plan.

- 1. Trained workers shortage.
- 2. Latest equipment's unavailability
- 3. Managements restriction/centralization of authorities
- 4.

- 1. Action plan can suffer due to interference of political or management's.
- 2. Non availability of resources can also disturb plan.
- 3. Multitasking duties and overburden of work can also fail the action plan.



| Training Title:  | O & M Module 1 and Module 4 | Date of Training: | Dec.26-Dec 30 <sup>th</sup> , 2016 |
|------------------|-----------------------------|-------------------|------------------------------------|
| Name of Particip | oant: Souman Khalid         |                   |                                    |
| Name of Organiz  | zation: WASA Lahore         |                   |                                    |

Please list three important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on SOP, Record Keeping, Preventive maintenance and HSE*)

1.

Implementation plans for Sop's, Record keeping, preventive maintenance and HSE.

2.

Check for implementation of above mentioned plans on regular basis.

3.

Always try to improve the plans and implement them.

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA.

| Sr.<br>No. | Action Item<br>(what)                         | Responsible<br>(who) | Due Date<br>(when) | Date<br>Completed | Comments |
|------------|---|----------------------|--------------------|-------------------|----------|
| 1          | Provision of maintenance plan<br>for pumps    | SDO&SE               | 15-1-2017          |                   |          |
| 2          | Implementation of the plan(Regular basis)     | Operator             | 20-1-17<br>weekly  |                   |          |
| 3          | Inspections for regular proper implementation | Sub- Engg            | 27-1-17<br>weekly  |                   |          |
| 4          |   | SDO&SE               | 15-2-17            |                   |          |
|            | Make a better plan or follow previous one.    |                      | Every Month        |                   |          |

1. Time

2. Manuals

- 3. Trainer
- 4.Funds(For prizes)

Please identify any barriers or hindrances to the implement this plan.

- 1. Frequent public complaints(Time)
- 2. Political involvements
- 3. Attitude of workers

**Other Comments or Notes:** 

The plan can be implemented with some efforts and the support of high-ups to ensure the decrease in political pressure .If implemented this plan can reduce a lot of breakdown complaints and may give a huge relief to public as well as departments budget.



| Training Title:  | O & M Module 1 and Module 4 | Date of Training: | Dec.26-Dec 30 <sup>th</sup> , 2016 |
|------------------|-----------------------------|-------------------|------------------------------------|
| Name of Particip | oant: <u>Waqas Liaqat</u>   |                   |                                    |
| Name of Organiz  | zation: WASA Lahore         |                   |                                    |

Please list three important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on SOP, Record Keeping, Preventive maintenance and HSE*)

1.

Preparation of maintenance history of every installation

2.

| Focus on | n problema | atic/weak | areas | and | make | improve | ment plan |
|----------|------------|-----------|-------|-----|------|---------|-----------|
|          |            |           |       |     |      |         |           |

3.

Consultation with lower staff for important and then prepare plan for improvement with the consultation of higher ups.

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA.

| Sr.<br>No. | Action Item<br>(what)                 | Responsible<br>(who) | Due Date<br>(when) | Date<br>Completed | Comments |
|------------|---------------------------------------|----------------------|--------------------|-------------------|----------|
| 1          | Identify low performance installation | SDO                  |                    |                   |          |
| 2          | Checking needs repair/                | SE                   |                    |                   |          |
| 3          | Make proper/Estimate                  | SE                   |                    |                   |          |
| 4          | Pursue until job done                 | SDO                  |                    |                   |          |

- 1. Installation history, its useful life etc.
- 2. Strong justification for its improvement
- 3. Required specification
- 4.Funds

Please identify any barriers or hindrances to the implement this plan.

- 1. Funds availability
- 2. Management interest
- 3.



| Training Title:  | O & M Module 1 and Module 4 | Date of Training: | Dec.26-Dec 30 <sup>th</sup> , 2016 |
|------------------|-----------------------------|-------------------|------------------------------------|
| Name of Particip | pant: M Shakeel Ahmed       |                   |                                    |
| Name of Organiz  | zation: WASA Multan         |                   |                                    |

Please list three important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on SOP, Record Keeping, Preventive maintenance and HSE*)

1.

Keeping the all record that you need the time of maintenance.

2.

Trained the supervisor and other staff to maintain the site.

3.

Management is strong about the maintenance works.

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA.

| Sr.<br>No. | Action Item<br>(what)                                  | Responsible<br>(who) | Due Date<br>(when) | Date<br>Completed | Comments                 |
|------------|--|----------------------|--------------------|-------------------|--------------------------|
| 1          | Contact KSB to request for provide gate valves         | SDO                  | 5-1-2017           | 10-1-2017         | Installed the gate valve |
| 2          | Review draft to finalize the plan according the mothod | Sub- Engg            | 15-1-17            | 15-1-2017         |                          |
| 3          | Visit the site with technical team                     | SDO and<br>Sub- Engg | 20-1-17            | 23-1-2017         | Completed the visited    |
| 4          |  |                      |                    |                   |                          |

- 1. Financial support for the body.
- 2. Key plan is ready to do the work at site
- 3. Man power is available for work.
- 4. Technical experts are provided the instructions to team.
- 5. All the work is to be done in specification.

Please identify any barriers or hindrances to the implement this plan.

- 1. Technical Team
- 2. Funds
- 3. Required tools for maintenance and operation

Other Comments or Notes:

All the team is to need the training about the maintenance provided the all tools at the site. Management is also to strong .Responsible peoples are known about the site.



| Training Title: O & N | A Module 1 and Module 4 | Date of Training: | Dec.26-Dec<br>30 <sup>th</sup> , 2016 |
|-----------------------|-------------------------|-------------------|---------------------------------------|
| Name of Participant:  | Umair Ayub              |                   |                                       |
| Name of Organization: | WASA Multan             |                   |                                       |

Please list three important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on SOP, Record Keeping, Preventive maintenance and HSE*)

1.

Importance of preventive maintenance

2.

The need to train the tube wells and pumps operators

3.

Importance of record keeping

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA.

| Sr.<br>No. | Action Item<br>(what)   | Responsible<br>(who) | Due Date<br>(when) | Date<br>Completed | Comments |
|------------|---|----------------------|--------------------|-------------------|----------|
| 1          | Requesting of O&M manuals from our vendors                              | SDO                  | 7-1-2017           |                   |          |
| 2          | Training the operators about standard SOP's                             | SDO and<br>Sub- Engg | 1-2-17             |                   |          |
| 3          | Maintain and develop a sustainable inspection plan for pumps and motors | SDO and<br>Sub- Engg | 1-2-17             |                   |          |
| 4          |   |                      |                    |                   |          |

1. O&M manuals for all pumps, motors, valves and filtration plants

2. Standard maintenance products of required quality

3. Most important thing would be continuous inspection and maintenance plans regardless of the changing personal charge of facilities.

4.

Please identify any barriers or hindrances to the implement this plan.

- 1. Most difficult barrier can be the intra departmental communication about following a common plan for inspection of pumps, valves and motors.
- 2. 3.
- 2.

Annex 3.57 Action Plan 2 for O&M of Mechanical Equipment in Fall 2016



| Training Title:  | O & M Module 5 and Module 7 | Date of Training: | Jan 9 <sup>th</sup> -Jan<br>13 <sup>th</sup> , 2017 |
|------------------|-----------------------------|-------------------|---|
| Name of Particip | pant: <u>Aamir Tufail</u>   |                   |   |
| Name of Organiz  | zation: WASA Lahore         |                   |   |
|                  |                             |                   |   |

Please list five important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on assembly components, preventive maintenance, operating procedures and HSE*)

- 1. HSE
- 2. Understanding equipment components and their functions
- 3. Preventive maintenance plan
- 4. SOPs
- 5. Record keeping

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA. "Develop equipment maintenance log for Ichra Sub Division O& M"

| Sr.<br>No. | Action Item<br>(what)                                | Responsible<br>(who)    | Due Date<br>(when) | Date<br>Completed | Comments |
|------------|--|-------------------------|--------------------|-------------------|----------|
| 1          | Plan or discuss with SDO                             | SE                      | 5-2-17             | 5-2-17            |          |
| 2          | Call a meeting to discuss detail                     | SDO                     | 8-3-17             | 9-3-17            |          |
| 3          | Review draft list to finally list of vehicles driver | Computer<br>operator/SE | 15-3-17            | 16-3-17           |          |
| 4          | Meeting with team for discussion                     | SE/SDO                  | 25-3-17            | 26-3-17           |          |
| 5          | Implementation                                       | SE/SDO                  | 2-4-17             | 2-4-17            |          |

- 1. Good team
- 2. Proper material
- 3. Effort of all team specially immediate boss
- 4.
- 5.

Please identify any barriers or hindrances to the implement this plan.

1.Bad team

2.Shoratge of time for planning

3.miner resources



| Training Title: O & M   | Module 5 and Module 7 | Date of Training: | Jan 9 <sup>th</sup> -Jan<br>13 <sup>th</sup> , 2017 |
|-------------------------|-----------------------|-------------------|---|
| Name of Participant: Fa | ayyaz Ahmed           |                   |   |
| Name of Organization:   | WASA Lahore           |                   |   |

Please list five important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on assembly components, preventive maintenance, operating procedures and HSE*)

- 1. HSE 1.PPE
- 2. Understanding equipment components and their functions 2. Equipment Record
- 3. Preventive maintenance plan 3. Vehicles maintenance schedules
- 4. SOPs 4.store space management
- 5. Record keeping 5. Work time measurement

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA. "Develop equipment maintenance log for South Drainage Yard"

| Sr.<br>No. | Action Item<br>(what)                               | Responsible<br>(who) | Due Date<br>(when) | Date<br>Completed | Comments |
|------------|---|----------------------|--------------------|-------------------|----------|
| 1          | Meeting with staff                                  | SDO                  | 20-1-17            |                   |          |
| 2          | Production of protective equipment lists from store | Sub Engineer         | 22-1-17            |                   |          |
| 3          | Allocation of equipment's to staff as required      | SE                   | 24-1-17            |                   |          |
| 4          | On job implementation distribution of equipment's   | SE                   | 26-1-17            |                   |          |
| 5          | Finalizing of lists and reviews                     | SDO+SE               | 30-1-17            |                   |          |

- 1. Stock register
- 2. Procured equipment's along with user manuals
- 3. Trained supervisor + workers
- 4. Office work place
- 5. Organizational SOP'S

Please identify any barriers or hindrances to the implement this plan.

1.Overloading of work

2.Multitasking job

3.Improper and non-maintained stocks/records

Other Comments or Notes:

The procurement of equipment's for safety is mostly carried out by the procurement and stores department, so the equipment's are most of the times are not procured as per requirements.



| Training Title:  | 0 & M           | Module 5 and Module 7 | Date of Training: | Jan 9 <sup>th</sup> -Jan<br>13 <sup>th</sup> , 2017 |
|------------------|-----------------|-----------------------|-------------------|---|
| Name of Particip | oant: <u>So</u> | ouman Khalid          |                   |   |
| Name of Organiz  | zation:         | WASA Lahore           |                   |   |
|                  |                 |                       |                   |   |

Please list five important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on assembly components, preventive maintenance, operating procedures and HSE*)

- 1. HSE
- 2. Understanding equipment components and their functions
- 3. Preventive maintenance plan
- 4. SOPs
- 5. Record keeping

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA. "Develop equipment maintenance log for WASA workshop Lahore"

| Sr.<br>No. | Action Item<br>(what) | Responsible<br>(who) | Due Date<br>(when) | Date<br>Completed | Comments |
|------------|-----------------------|----------------------|--------------------|-------------------|----------|
| 1          | Record keeping        | SE/SDO               | 7-2-17             |                   |          |
| 2          | SOP's                 | SE/SDO               | 17-3-17            |                   |          |
| 3          | HSE                   | SDO/SE/XE<br>N       | 15-4-17            |                   |          |
| 4          | Inspection            | Operators/SE<br>/SDO | 31-5-17            |                   |          |
| 5          |                       |                      |                    |                   |          |

1. Time

- 2. Funds
- 3. Manpower
- 4. Management
- 5.

Please identify any barriers or hindrances to the implement this plan.

1.Lack of time because of urgent official works.

2.No implementation of HSE in WASA ,Previously

3.No regular SE available of the moment



| Training Title:  | O & M          | Module 5 and Module 7 | Date of Training: | Jan 9 <sup>th</sup> -Jan<br>13 <sup>th</sup> , 2017 |
|------------------|----------------|-----------------------|-------------------|---|
| Name of Particip | pant: <u>W</u> | Vaqas Liaqat          |                   |   |
| Name of Organi   | zation:        | WASA Lahore           |                   |   |
|                  |                |                       |                   |   |

Please list five important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on assembly components, preventive maintenance, operating procedures and HSE*)

- 1. HSE
- 2. Understanding equipment components and their functions
- 3. Preventive maintenance plan
- 4. SOPs
- 5. Record keeping

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA. "Develop equipment maintenance log for water supply WASA liaqat Bagh Rawalpindi"

| Sr.<br>No. | Action Item<br>(what)  | Responsible<br>(who) | Due Date<br>(when) | Date<br>Completed | Comments |
|------------|--|----------------------|--------------------|-------------------|----------|
| 1          | Compile vehicles drivers license etc.                                      | SE                   | 18-1-17            |                   |          |
| 2          | Vehicles fitness certificates  | SE                   | 25-1-17            |                   |          |
| 3          | Vehicles preventive<br>maintenance schedule                                | SE                   | 30-1-17            |                   |          |
| 4          | Making SOP's for drivers   | SE                   | 30-1-17            |                   |          |
| 5          | Display of SOP's and reduce<br>fitness and driver's license on<br>5S board | SE                   | 2-2-17             |                   |          |

| . Management support |  |
|----------------------|--|
| 2.                   |  |
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| l.                   |  |
| 5.                   |  |
|                      |  |

Please identify any barriers or hindrances to the implement this plan.

1. Funds shortage for preventive maintenance.

2. Audit observation for preventive maintenance.

3.No specific SOP's for preventive maintenance present

Other Comments or Notes:

The induction policy of heavy machinery drivers should be streamlined in terms of merit and education .The vehicle/machinery health depends upon its user. If the operator is well aware of its job then the machine needs less repair and less resource ultimately required.



| Training Title:  | O & M Module 5 and Module 7 | Date of Training: | Jan 9 <sup>th</sup> -Jan<br>13 <sup>th</sup> , 2017 |
|------------------|-----------------------------|-------------------|---|
| Name of Particip | ant: M.Zain ul abdin        |                   |   |
| Name of Organiz  | zation: WASA Faisalabad     |                   |   |

Please list five important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on assembly components, preventive maintenance, operating procedures and HSE*)

- 1. HSE 1.5S Technique
- 2. Understanding equipment components and their functions 2.SOP of jetting machine/Sucker machine
- 3. Preventive maintenance plan 3. Safety arrangements before completion of jobs
- 4. SOPs 4.Computerized record
- 5. Record keeping 5. Schedule maintenance & preventive maintenance according to record to manual inspect

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA. "Develop equipment maintenance log for South Drainage Yard"

| Sr.<br>No. | Action Item<br>(what)                                   | Responsible<br>(who)    | Due Date<br>(when) | Date<br>Completed | Comments |
|------------|---|-------------------------|--------------------|-------------------|----------|
| 1          | Call a meeting to discuss 5S in XEN office with staff   | XEN                     | 17-1-17            | 17-1-17           |          |
| 2          | Completion of all items list and location specification | SDO and Sub<br>Engineer | 20-1-17            | 29-1-17           |          |
| 3          | Machinery ,Dumper,<br>Excavator ,for smooth surface     | SE                      | 03-2-17            | 5-2-17            |          |
| 4          | Implementation technique of 5S at office                | SE                      | 8-2-17             | 9-2-17            |          |
| 5          | Implementation of 5S technique at O&M store             | SDO+SE                  |                    |                   |          |

- 1. Dumpers and excavators from JICA parking road.
- 2. Boards
- 3. Racks
- 4.
- 5.

Please identify any barriers or hindrances to the implement this plan.

1.Budget

2.

3.



| Training Title:  | O & M Module 5 and Module 7 | Date of Training: | Jan 9 <sup>th</sup> -Jan<br>13 <sup>th</sup> , 2017 |
|------------------|-----------------------------|-------------------|---|
| Name of Particip | ant: M Shakeel Ahmed        |                   |   |
| Name of Organiz  | zation: <u>WASA Multan</u>  |                   |   |

Please list five important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on assembly components, preventive maintenance, operating procedures and HSE*)

- 1. HSE 1.Checking the attendance the staff
- 2. Understanding equipment components and their functions 2. Check the work suction/jetting machine
- 3. Preventive maintenance plan 3. Desilting schedule of hasan parana sub division
- 4. SOPs 4.Safety equipment's are used in the field
- 5. Record keeping 5. Complete the log books and all old material

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA. "Develop equipment maintenance log for South Drainage Yard"

| Sr.<br>No. | Action Item<br>(what)                                   | Responsible<br>(who) | Due Date<br>(when) | Date<br>Completed | Comments |
|------------|---|----------------------|--------------------|-------------------|----------|
| 1          | Check the daily performance of staff                    | SE                   | 14-1-17            |                   |          |
| 2          | Checking the complaints register and resolve complaints | SE                   | 14-1-17            | 17-1-17           |          |
| 3          | Desilting schedule in sub division                      | SDO/SE               | 14-1-17            | 25-1-17           |          |
| 4          |   |                      |                    |                   |          |
| 5          |   |                      |                    |                   |          |

Implement this plan in office
 To manage the labor time table
 .
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Please identify any barriers or hindrances to the implement this plan.

| 1.No hindrance |  |  |
|----------------|--|--|
| 2.             |  |  |
| 3.             |  |  |
|                |  |  |
|                |  |  |



| Training Title:  | O & M Module 5 and Module 7 | Date of Training: | Jan 9 <sup>th</sup> -Jan<br>13 <sup>th</sup> , 2017 |
|------------------|-----------------------------|-------------------|---|
| Name of Particip | oant: Umair Ayub            |                   |   |
| Name of Organiz  | zation: WASA Multan         |                   |   |
|                  |                             |                   |   |

Please list five important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on assembly components, preventive maintenance, operating procedures and HSE*)

- 1. HSE 1.Creating maintenance schedule for jetting and sucker units
- 2. Understanding equipment components and their functions
- 3. Preventive maintenance plan
- 4. SOPs
- 5. Record keeping

Sewerage Division

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA. "Develop equipment maintenance log for South Drainage Yard"

| Sr.<br>No. | Action Item<br>(what)                                  | Responsible<br>(who) | Due Date<br>(when) | Date<br>Completed | Comments |
|------------|--|----------------------|--------------------|-------------------|----------|
| 1          | Vehicle list with vehicle number                       | SDO/SE               | 20-1-17            |                   |          |
| 2          | List of drivers with their license number              | Sub<br>Engineer      | 20-1-17            |                   |          |
| 3          | Arranging maintenance<br>manufacturer for all vehicles | SDO/SE               | 25-1-17            |                   |          |
| 4          | Create a maintenance log for monthly inspection        | SDO/SE               | 25-1-17            |                   |          |
| 5          | Quarterly review of maintenance log                    | SDO+SE               |                    |                   |          |

| 1. Company maintenance manual's for trucks and tractor and for the jetting and suction limits |
|---|
| 2.  |
| 3.  |
| 4.  |
| 5.  |
|   |

Please identify any barriers or hindrances to the implement this plan.

| 1.Budget |      |  |
|----------|------|--|
| 2.       |      |  |
| 3.       |      |  |
|          |      |  |
|          | <br> |  |



| Training Title:   | O & M Module 5 and Module 7    | Date of Training: | Jan 9 <sup>th</sup> -Jan<br>13 <sup>th</sup> , 2017 |
|-------------------|--------------------------------|-------------------|---|
| Name of Participa | ant: <u>Aamir Hussain shah</u> |                   |   |
| Name of Organiz   | ation: WASA Rawalpindi         |                   |   |

Please list five important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on assembly components, preventive maintenance, operating procedures and HSE*)

- 1. HSE 1.Tube well
- 2. Understanding equipment components and their functions 2. Filtration plant
- 3. Preventive maintenance plan 3. Overhead reservoir
- 4. SOPs 4.Site office
- 5. Record keeping 5. Water meters

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA. "Develop equipment maintenance log for water supply WASA liaqat Bagh Rawalpindi"

| Sr.<br>No. | Action Item<br>(what)     | Responsible<br>(who) | Due Date<br>(when) | Date<br>Completed | Comments |
|------------|---------------------------|----------------------|--------------------|-------------------|----------|
| 1          | Meeting held              | SDO                  | 18-1-17            |                   |          |
| 2          | Tube well check           | T.W<br>inspector     | 21-1-17            |                   |          |
| 3          | Filtration plant cleaning | T.W inspector        | 25-1-17            |                   |          |
| 4          | OHR                       | Supervisor           | 28-1-17            |                   |          |
| 5          | Site office               | SE                   | 30-1-17            |                   |          |

- 1. Tube well log book
- 2. Safety material
- 3. Shoes
- 4. Gloves
- 5. Torch light

Please identify any barriers or hindrances to the implement this plan.

| 2. |  |
|----|--|
| 3. |  |
|    |  |



| Training Title: O & M             | 1 Module 5 and Module 7 | Date of Training: | Jan 9 <sup>th</sup> -Jan<br>13 <sup>th</sup> , 2017 |  |  |  |
|-----------------------------------|-------------------------|-------------------|---|--|--|--|
| Name of Participant: Noshad Aslam |                         |                   |   |  |  |  |
| Name of Organization:             | WASA Rawalpindi         |                   |   |  |  |  |

Please list five important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on assembly components, preventive maintenance, operating procedures and HSE*)

- 1. HSE 1.Tube well
- 2. Understanding equipment components and their functions 2. Filter plant
- 3. Preventive maintenance plan 3. Overhead reservoir
- 4. SOPs 4.Ground storage tanks
- 5. Record keeping 5. Valve chamber

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA. "Develop equipment maintenance log for "Shamsabad water supply Rawalpindi"

| Sr.<br>No. | Action Item<br>(what) | Responsible<br>(who) | Due Date<br>(when) | Date<br>Completed | Comments |
|------------|-----------------------|----------------------|--------------------|-------------------|----------|
| 1          | Check the tube wells  | T.W<br>inspector     | 17-1-17            |                   |          |
| 2          | Check filter plants   | T.W inspector        | 19-1-17            |                   |          |
| 3          | Overhead reservoir    | W/S<br>Supervisor    | 22-1-17            |                   |          |
| 4          | Valves chamber        | W/S<br>supervisor    | 24-1-17            |                   |          |
| 5          | Ground storage tank   | W/S<br>Supervisor    | 28-1-17            |                   |          |

- 1. Staff equipment's
- 2. Helmet
- 3. Gloves
- 4. Shoes
- 5. Torch light

Please identify any barriers or hindrances to the implement this plan.

| 1.Acceptance by the office staff |  |
|----------------------------------|--|
| 2.                               |  |
| 3.                               |  |
|                                  |  |
|                                  |  |

Annex 3.58 OJT Implementation Procedure for Leakage Detection in Fall 2016 - Spring 2018

## Procedure of On the Job Training

JICA Expert of Leak Detection

## 1 Leakage Detection

| No. | Items  | Check |
|-----|--|-------|
| 1.  | Preparation of the pipeline map (based on GIS data)                          |       |
| 2.  | Preparation of the pipeline map of the leak detection site                   |       |
| 3.  | Confirmation of the start and end point of leak detection                    |       |
| 4.  | Confirmation of the leakage repair history/record near detection site        |       |
| 5.  | Information of the pipe (location, depth, material, diameter and lying age)  |       |
| 6.  | Information of the valve chamber, fire hydrant, and mother meter             |       |
| 7.  | Information of the kind of pavement (Co/As/None) and thickness               |       |
| 8.  | Preparation of the transportation  |       |
| 9.  | Confirmation of the leak detection team member's role                        |       |
| 10. | Confirmation of the departure time   |       |
| 11. | Check of the traffic condition and the event near the detection site         |       |
| 12. | Preparation of the working shoes, reflection vest and headlight              |       |
| 13. | Check and charging of the battery of leak detector and equipment             |       |
| 14. | Reporting of the result of leak detection (Survey length, No. of leak found) |       |

| Checked by  | , Date |
|-------------|--------|
| Approved by | , Date |
| Approved by | , Date |

## Procedure of On the Job Training

JICA Expert of Leak Detection

## 2 Leakage repairing

| No. | Items   | Check |
|-----|---|-------|
| 1.  | Confirmation of the leakage occurrence contact receiving date and time      |       |
| 2.  | Confirmation of the location/address of the leakage repairing site          |       |
| 3.  | Confirmation of the visible scale of leakage (Large/Moderate/Small)         |       |
| 4.  | Confirmation of the road condition (Spouting/Submergence/Subsidence)        |       |
| 5.  | Preparation of the pipeline map of the leakage site                         |       |
| 6.  | Confirmation of the shutdown valves location                                |       |
| 7.  | Confirmation of the non-passage road area and detour (bypass) route         |       |
| 8.  | Confirmation of the leakage repair equipment, material and quantity         |       |
| 9.  | Confirmation of the leakage repair team member's role                       |       |
| 10. | Check of the traffic condition and the event near the leakage point         |       |
| 11. | Preparation of the transportation   |       |
| 12. | Confirmation of the departure time  |       |
| 13. | Preparation of the working shoes, reflection vest and headlight             |       |
| 14. | Information of the pipe (location, depth, material, diameter and lying age) |       |
| 15. | Information of the valve chamber, fire hydrant, and mother meter            |       |
| 16. | Information of the kind of pavement (Co/As/None) and thickness              |       |
| 17. | Contact to the Police and relative traffic organization                     |       |
| 18. | Reporting of the repair work result (Consumption material, quantity)        |       |

| Checked by  | , Date |
|-------------|--------|
| Approved by | , Date |
| Approved by | , Date |

Annex 3.59 OJT Implementation Procedure 1 for O&M of Electrical Equipment in Fall 2016

10

|             |               |                  |              | KEN (08   | 10-1) 4 BT                              |                    |  |          |            |                      | Approv                                   | ved by               |   |         |                                   |                           |                  |
|-------------|---------------|------------------|--------------|---|---|--------------------|--|----------|------------|----------------------|--|----------------------|---|---------|-----------------------------------|---------------------------|------------------|
| WA          | SA: Lal       | hore             | Division :   | Gulshor<br>Ravi   | r-e                                     | Sub Divis          | ion: Gulshom - e-k   | 2avi s   | sloin      |                      | Prepar                                   | ed by                | SAE   | ED      | AHM                               | 4D 1                      | CHAR             |
|             | en an Shanari | Sector Sector    |              |   | 13. C. Marter 1                         | ales Databas       |  |          | 20         | 16                   |  | AHO                  | E   | MA      | SA                                | ( 1. MAL 24               |                  |
|             |               | Adm              | ninistrative | Informatio  | n                                       |                    | and the second s | N        | ov ·       |                      | ec                                       | J                    | ari   |         | eb                                | M                         | lar              |
| Site<br>Ne. | Loca          | ation            | Nam          | e of the P  | ersons in Ch                            | narge              | Contents of Activity   | Planning | Completed  | Plenning             | Completed                                | Planning             | Completed   | Plening | Completed                         | Plenning                  | Completed        |
|             | Sub Division  | Site Name        | XEN          | SDO   | Sub Engineer                            | Operator           | 一位和你们的问题。"这种问题是  | Dete     |            | Dete                 | 1.000                                    | Dete                 | - Sperce  | Dete    | 04241100                          | Dete                      | 21800            |
|             | Gulshom       | G-BLock          | Shohail      | Shokat  | Saeed                                   |                    | Daily Operation Record   | 291      | 0          | $\gamma_{k}^{(i)} =$ |  | 1999<br>1919<br>1919 |   | 144     |                                   |                           | 122              |
| 1.          | e-Ravi        | Gulshone<br>Ravi | Aslam        | ARI   | Ahmoral                                 | Told States        | SOP Check List   | 2016     | 0          |                      |  | 歴史                   | 14433   | 1 the   |                                   |                           | 12.1             |
|             |               | Ravi             | Sindhu       | ta Barapan<br>Galaria                                     | Khom -                                  | THE REAL           | Preventive Maintenance Record  |          | 0          | 11 B<br>44 0 J       | 1413                                     | -<br>Hong & :        | All and a second  |         | A Charles                         | and and                   |                  |
|             |               |                  | 國際總統         | - (2019) 223  |   | A Sheres           | Daily Operation Record   | die.     | 1.4973     | 183                  | $-\underline{a}(z)\xi$                   | 28D                  |   | North   | 1点4220                            |                           | 1,241            |
| 2           | the second    | a second         |              |   |   | 1242 (14           | SOP Check List   | 19.3     | 2.016      |                      | (Tariang St                              | is and a set         | $= \frac{1}{2} e^{-\frac{1}{2} \left( \frac{1}{2} + \frac{1}{2} \right)}$ |         | 1000                              |                           | 1.1              |
|             |               | Sec.             | (States)     | 1203804   | 的影响。                                    |                    | Preventive Maintenance Record  | Page     | 2838       | Sec. 1               | 12.20                                    |                      | 1993  |         | $\mathcal{Z}^{1,n-1}(\mathbb{R})$ | 19030 (1<br>1903)<br>1903 | dington.         |
|             | Wheeler.      | "你们你们。"          | Sections.    | STREET.   |   | 1 North            | Daily Operation Record   | 派室       | the set of | 16.4                 | 130.00                                   |                      | , kales   | 11.14   | 17.58                             |                           | ezer k           |
| 3.          |               |                  | State State  |   |   |                    | SOF Check List   |          | 1.234.9    |                      | 199222                                   | 》是近。<br>1973年        | 12.0.000  |         | $\{\beta_i\} \geq \delta$         |                           | 2262.5           |
|             | A STREET      | 134.32           |              |   |   |                    | Preventive Maintenance Record  | 125      | 1223       |                      | 1.1.525                                  |                      | -524  | D. Eler | 1.200 (2)                         | 1122                      | en ight.         |
| 1           |               | a Charles        | 12232        |   | Star Star                               | a anti-            | Daily Operation Record   | 1647     | the second |                      | $[\neg \delta_{ij}]_{ij} \in \mathbb{C}$ | 關係                   | 1254  |         | 1949 (A)                          | 12/21                     | 1953.7           |
| 4           |               |                  |              |   |   |                    | SOP Check List   | 運行       | 6266       |                      | N7/94                                    |                      | 4000  |         | Sec.                              |                           | 92,824           |
|             |               |                  |              | 1236439   | and the second                          | Star May           | Preventive Maintenance Record  |          | 1929       | 1.1                  | 120050                                   | 1928                 | 10138   |         | 1.56                              | all a                     | sti alt <u>e</u> |
| F           |               | - ASTERNA        | 10.2017      | $\mathcal{B}_{\mathrm{eff}} = \mathcal{B}_{\mathrm{eff}}$ | 和公司的                                    | . The state of the | Daily Operation Record   | Sign     |            |                      | 42953                                    |                      | 1994  |         | 12.13                             |                           | 1.2.24           |
| 5           |               | 1000             | 1.1.1.1      |   |   | No.                | SOP Check List   |          | Street.    |                      | 1203                                     | (aug)<br>Sena        | 1821  |         | barri pi                          | and the                   | 1991             |
|             | 334.44        |                  | - Charles    | 1200  | 1935                                    |                    | Preventive Maintenance Record  | 1. Beld  | 1.197-15   | 532                  | 1.6.653                                  | 1744                 | a liter   |         | ter de la                         |                           |                  |
| T           | 121323258     | No.              | · 10.285.00  | S. S                  | ting the                                | Sec.               | Daily Operation Record   |          | 2,23%      | 15752                | $\leq  f(x_i) _{t=1}^{\infty}$           | AL.                  | 1.50  |         | 1.573                             | 3. A. L                   | 1912             |
|             | . 28.38       | and the second   |              |   | 17 - 14 - 14 - 14 - 14 - 14 - 14 - 14 - |                    | SOP Check List   | 12       | 1.4000     |                      | -  |                      | 9.6559.60   |         | 1                                 |                           |                  |
|             |               | Start and        |              | C. B. C. State  | 1-12-12-12                              | 4.49               | Preventive Maintenance Record  | 19.9     | 100        | 1214                 | 1  | ang di kara          | 19709   | 4       | 1                                 | in set                    |                  |

X insulation resistance couldn't be performed.

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M. Zaheer Rana WASA LAR

#### Approved by

WASA: Labore Division: 19bal Town Sub Division: Johar Jown

| 1.22  | States Stream | A REPORT                 | ninistrative                              | Information   | ARA RAIN   | Salven da se   | La Martina Martin de Martina   |                  | 20                        | 16                   |  |                  |  | 20                        | 017  | 111              | 1.22.14                |
|-------|---------------|--------------------------|---|---|--|----------------|--|------------------|---------------------------|----------------------|--|------------------|--|---------------------------|--|------------------|------------------------|
| 1     | SACOME (AL)   | Adn                      | ninistrative                              | informatio  | on and a set   | at 12 when the | $(q_{1},q_{2}) = \left( \frac{1}{2} \left( \frac{1}{2} \left( \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \left( \frac{1}{2} \right) + \frac{1}{2} \left( \frac{1}{2} \right) \right) \right) \right) \right)$ | N                | ov                        | Ď                    | ec                                       | J                | an   | F                         | eb   | N                | lar                    |
| Site  | Loc           | ation                    | Nam                                       | e of the P  | ersons in C  | harge          | Contents of Activity   | Planning<br>Data | Completed                 | Planning<br>Date     | Completed                                | Planning<br>Date | Completed  | Planning<br>Data          | Completed  | Planning<br>Date | Complete               |
|       | Sub Division  | Site Name                | XEN                                       | SDO   | Sub Engineer   | Operator       | 网络帕尔尔尔 计标识书 网络古人人  | Uete             |                           | Date                 |  | Data             | 7000   |                           |  |                  | Constant<br>Constant   |
| 4     | Tolar         | A-BLOCN                  | Sohail                                    | Salway  | Marris   | Imray          | Daily Operation Record   | - 0.4            |                           |                      | $(1, r) \in \mathbb{Z}^{n}$              |                  |  | $(\cdot,\cdot)_{q^{(i)}}$ | $\{f_{i}(q_{i})\}$   | 1980             | 1                      |
| 1.    | in the of     | A-Block<br>T/w           | Qadir                                     | nlisax  | Hassan   | ALI            | SOP Check List   | 29th             |                           | 1. 15- 14-1          | $\{(S^{(1)})_{i\in I}\}$                 |                  | - Ø  | - Elifert<br>100          |  | -44-19           | 1.5                    |
| - 10- | Jown          | '/"                      | Cheena                                    | Consider the Att Att Att Att Att Att Att Att Att At | a de la comita   |                | Preventive Maintenance Record  | (金)              |                           | 個語                   |  |                  | 12.25  |                           | 1.1  | and a            | 11134                  |
| 1     |               | 1.50276-31               | M. Ball                                   | 開拓的短期   | 派派的派   | 0.76785        | Daily Operation Record   | Region and       | 10.795                    |                      | 10.802                                   | 12               | 1,25,6   | 325                       | 11.92  | 1557             | 1.0553                 |
| 2     |               | Same had                 | $\{a_i\}_{i=1}^{n-1} \{a_i\}_{i=1}^{n-1}$ | And the second second                               | and the second   | -              | SOP Check List   | X.               | 2330                      |                      | 10535                                    |                  | 10 20 20   | 1922                      | teleter.   |                  | 199545                 |
| 1     |               | 33.44                    |   | And A.  | 111236   |                | Preventive Maintenance Record  |                  | and the                   | Sugar 1              | 2204                                     | State -          | 1.24   | 1.00                      | point a  |                  | 1.14                   |
| 9     | Tradition.    | station -                | T. O. A. S.                               | 19,31,975   |  | 1332-3         | Daily Operation Record   | · 杨雪花            | 1.282                     |                      | 1040                                     |                  | 10.00  | in the second             | and a second   | 52               | $<\pi^* T_{1,1}^{(1)}$ |
| 3.    |               |                          | and have                                  |   |  |                | SOP Check List   |                  | 1954                      |                      | 1.15                                     |                  | $\mathcal{T}_{\mathcal{T}}(\mathcal{A}_{\mathcal{T}})$ |                           | 1292   |                  | 1000                   |
|       | Carles .      | 1997 199                 |   | Section 1   | $= \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \right] + \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \right] + \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \right] + \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \right] + \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \right] + \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \right] + \frac{1}{2} \left[ $ |                | Preventive Maintenance Record  | 1811             | 7.622                     | 1949<br>1949<br>1949 | 3-32° P                                  | 的理论              | - Alger  | 1940                      | $\{T_n\}_n \{T_n^{-1}\}_n$   | 1000             | 1000                   |
| 8     | 16/2010/201   | "BRIDES INT              | 1.958.6                                   | 13.35%  | NR 1550  |                | Daily Operation Record   |                  | day.                      |                      | 1997                                     |                  | 2.193  | 1220                      | and the second s |                  | 128.54                 |
| 4     |               |                          |   |   |  |                | SOP Check List   |                  | distant.                  |                      | 332                                      |                  | 13.516   |                           | jughin -   |                  | 1999 27                |
| \$    |               |                          | 19625                                     |   |  |                | Preventive Maintenance Record  | 1.4.3            | $g_{1}^{2}(\phi_{1}^{2})$ |                      | $\mathcal{A}_{ij}^{*}(\mathcal{D}_{ij})$ | A Stall          | 192239   | Sing.                     | 1993   | (4.28°)          | 1999-12                |
| T     | danies z      | Street St.               | PERSONAL PROPERTY                         | 17/28/5527  | 12762572   | white.         | Daily Operation Record   | The set          | Sec.                      |                      | ((e))(m)                                 |                  | 12.222   | Reg                       |  | A CONTRACT       | 1                      |
| 5.    |               |                          |   |   |  |                | SOP Check List   |                  | 8359                      |                      | A MARCE                                  |                  | 194.31   |                           | 1.2.49   |                  | produces.              |
|       |               |                          |   | Alter Ser   |  |                | Preventive Maintenance Record  |                  | 28812                     | 行物                   |  | Maria            | 2862   | 8.87                      | 16250  |                  | 1. 45/4                |
|       | nàs generati  | att for the state of the | nostrumper -                              | 4.47520   | C. C. Starter  | Casta Start    | Daily Operation Record   | 1.584            | the is                    | Still                | 1.5                                      |                  | 278  | 1.50                      |  | 12               | 144                    |
| 6.    |               |                          | 262                                       |   |  |                | SOP Check List   | 12.51            | analysis.                 |                      | ang d                                    |                  | ogerse.  |                           | (gliana)   |                  | -36.1                  |
|       |               |                          |   | Sent.   |  | 1.19           | Preventive Maintenance Record  | 100              | Page 1                    | Carl Ch              | 0200                                     |                  | der elle   | - Marken                  | 1.000  | 1.44             | Post 9                 |

| W     | ASA: Lal         | nore                | Division :        | Coulder  | 9                            | Sub Divis     | ion: Gulberg  |   |           |                          | Prepar                          | red by           | A   | പംന              | Jan                | ied              | THE REAL                          |
|-------|------------------|---------------------|-------------------|--|------------------------------|---------------|---|---|-----------|--------------------------|---------------------------------|------------------|---|------------------|--------------------|------------------|-----------------------------------|
| 3     | aparente te per  | Ad.                 | ninistrative      | Informatio   | - 10 10 3 Mar                | Weiter State  | STREET STREET   |   | 20        | 16                       |                                 |                  |   | 20               | 017                |                  |                                   |
| -     | to Hall share to | A                   |                   | informatio   |                              | With the With | Contents of Activity  | N   | ov        | Ď                        | lec                             |                  | an  | F                | eb                 | M                | lar                               |
| Siles | Loca             | ation               | Nam               | ne of the P  | ersons in Ch                 | arge          |   | Planning<br>Data  | Completed | Planning<br>Data         | Completed                       | Planning<br>Data | Completed   | Planning<br>Date | Completed          | Planning<br>Date | Completed                         |
|       | Sub Division     | Site Name           | XEN               | SDO  | Sub Engineer                 | Operator      | <ul> <li>A second sec<br/>second second sec</li></ul> |   |           |                          | 1.175 (F                        |                  | The real  | 11.1.481         | Contraction of the |                  | alle and                          |
|       | CI               |                     | -                 | 1017   |                              | 1.11月11日      | Daily Operation Record  | 28_   | E.A.F.    | 1 41                     | a ding                          | 一些推              | 1) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1  |                  | 1000               | 1.194            | 1.18.20                           |
| 1.    | Guberg           | A-3                 | Vanish            | Ampa   |                              | - 54          | SOP Check List  | -11 20  | 21.33     | 「大法」                     | 1. 1. 1                         | 的時               | 1 Parking   | で設定              | (100.5°);<br>C     | 영상               | 1973                              |
|       |                  |                     |                   | A State of the sta | 「小学校のため」」                    | 1.111月1日1日    | Preventive Maintenance Record   | 2016  | (15)143   |                          | 新花花                             | Sect-            |   |                  | - 3/2 4.           |                  | 1.1.1                             |
| 12    |                  | 网络后期                |                   |  | 1462921                      | NO.           | Daily Operation Record  | 50  | 5557      | $\gamma_{1} \bar{m}^{2}$ | 50222                           | 317              | $= \frac{1}{2} k_{1}^{2} k_{1}^{2} k_{1}^{2} \lambda_{1}^{2} \lambda_{1}^{2}$ | 222              | 100250             |                  | $\{\eta_{ij}\}_{j\in \mathbb{N}}$ |
| 2     | Gulberg          | A-1                 | Danish            | Amjad  | . <u> </u>                   | -             | SOP Check List  | 29.   | 12.25     |                          | $(\mathcal{D},\mathcal{D}_{i})$ | No.              | $v_{0} d \tilde{v}_{0}^{*} [ v_{0}^{*} ]$                                     |                  | 1.15 3.9           |                  | 1,51,92                           |
| 1     | June             | Section 1           | 1. Takara         | 3  | 1.33.9花                      |               | Preventive Maintenance Record   | 2016  | 110211    | 1993                     | 17965                           |                  | 1.259.5   | The second       | 1.1.1.2            | - Eggi           | 1.508                             |
|       |                  | 96448               | 1621122           | Section?   |                              | 1.5.200       | Daily Operation Record  |   | 827.01    | 5,93                     | 18-20                           | 新聞               | 12162   | ASA              | . A.W.             | 145              | 2.927                             |
| 3.    |                  |                     | 1982              | Sec. Com   |                              |               | SOP Check List  | 33  | 377.92    | (Cale                    | 1508                            |                  | 1332852   |                  | N 23               |                  | 1.16.198                          |
| 6 T 4 |                  | 19899               | Para de           |  |                              |               | Preventive Maintenance Record   | all he  | સંસંકો    | W.B.                     | 1982.3                          | that's           | 30579   | Shirt            | 28.24              | 84.5             | 1.18 - 1                          |
| 1     | 1/2023.          | Same Steel          | There and         | 12:53:2  | (Section)                    | Sau ar        | Daily Operation Record  |   | - Sta     | 1967                     | 11225                           |                  | nder a  | 200              |                    |                  |                                   |
| 4.    |                  |                     |                   |  | A Delicher and<br>Philippine |               | SOP Check List  | and states | 10515     |                          | 10.855                          |                  | 30.22   |                  | 19.22              |                  | est territ                        |
| 8     |                  |                     |                   |  | 12-25-28                     |               | Preventive Maintenance Record   | 343   | 12%       |                          | 1.122                           | 1968             | 389   | (district        | -246.              | 19965            | 1212                              |
|       | 10280-001        | -TANKA L            | 12.2.1544         | - 1995年1月  | 3000.75                      | A Store       | Daily Operation Record  | No. 14  | 16038     |                          | 1.1                             | 1976             | 1.155.64  |                  | A POT              |                  | 3.34                              |
| 5.    |                  |                     | 1. 1. 1.          |  | The second                   |               | SOP Check List  | 198   | (M)(3)    |                          | 10.25524                        |                  | 12022   |                  | 24.57              |                  | inertag                           |
|       | 24.1.11A         |                     | William.          |  |                              |               | Preventive Maintenance Record   | 196   | 0.50      |                          | Spin                            | 56.2             | 2.875   | 440.0            | 1. 65 25           | 25794.5          | Kalenda.                          |
|       | 1993284          | $[1,q^2/(p^2,q^2)]$ | 1. Section        | 1080310  | equilibrit.                  | (HERE)        | Daily Operation Record  | 导家庭   | 13/27%    | 62                       | 5.95                            | 115              | Selve #   | 123              | 1.2.2              |                  | Notestan<br>L                     |
| 6.    |                  |                     | The second second | 1999 - 1999<br>1997 - 1998<br>1997 - 1998  |                              |               | SOP Check List  |   | ange ang  | 1992                     | a transfer                      |                  | l'ages :  | -12              | -2015.5            |                  | ger Sy ger                        |
| 1     |                  | Sec. 1              | A States          | Sec. The   |                              |               | Preventive Maintenance Record   | and the   | W.S.W.    | 198                      | 149367                          | 1997             | 1. 1. 1. 1. 1.  | Ante-            | 1. Sector          |                  | NINSKI.                           |

Approved by

UMAIR ASGHAR.

Approved by

WASA : MULTAN

Division : P & D

Sub Division:

| 1           |  | Ada         | ninistrativ                                     | e Informat                               | ion the second | ALL ALL MARY                                 | a strategic to a strategic and a strategic and a |          | 20                | 16                           |             |              |           | 20           | 017           |                   | 1.11                                     |
|-------------|--|-------------|---|--|----------------|--|--|----------|-------------------|------------------------------|-------------|--------------|-----------|--------------|---------------|-------------------|--|
|             |  | Au          | ministrativ                                     | e mornat                                 | .ion           | Harl Standard                                | - 当然的名称,这些那些"                                    | N        | lov               | D                            | ec          | J            | an        | F            | eb            | N                 | lar                                      |
| Site<br>No. | Loc  | ation       | Na  | me of the                                | Persons in C   | harge  | Contents of Activity                             | Plenning |                   | Plenning                     |             | Planning     |           | Planning     | Completed     | Planing           |  |
|             | Sub Division   | Site Name   | XEN   | SDO                                      | Sub Engineer   | Operator                                     | - Softlikke amerika                              | Dete     | Completed         | Date                         | Completed   | Dete         | Completed | Date         | Compreted     | Dete              | Complet                                  |
|             | Formarpure   | Foxoavavo   | $z_{\rm H_2^+}(z), \overline{z}_{\rm H_2^+}(z)$ | 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1 | 1 States       | 1. C. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. | Daily Operation Record                           | 1200     | 0                 | 122                          | and a       | 「市市市         | 1         |              | 18            | 1                 | 12                                       |
| 1.          | SOUTH  |             | Terdiaq   | Augun                                    | Arshod         | Ansan  | SOP Check List                                   | 29       | 0                 | $1-\frac{1}{2}(\frac{1}{2})$ | 173093      |              |           |              | 14.93         | A.L.              | 1  |
|             |  | N Stranger  |   | ter and                                  |                | 1200   | Preventive Maintenance Record                    | 12.20    | -                 |                              | A State     |              | 1922      |              | in the second |                   | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1    |
| -           | 147144   | 100000      |   | The start                                | 100000         | 1005407                                      | Daily Operation Record                           | 22       | 12345             | 1993                         | -1014       | -SME         | 1.2       | 1977         | 11957         | 13/2              | 12                                       |
| 2           |  |             |   |  |                |  | SOP Check List                                   |          |                   | 27-11                        | -1.5        |              | 75877     |              | 600           |                   | 13                                       |
|             |  | No. 201     |   |  | 1. 10 10       |  | Preventive Maintenance Record                    | 643      | 12.306            | No.                          | 1.1019      | 100          | N YON     |              | 1-15-26       | 1.21              | 1. |
| 1           | Sec.M.d.   | 1.22        | 1.1840  | 的情况是                                     | 1000           |  | Daily Operation Record                           | 1247     | 1000              | 327                          | 14.50       | 法之外          | 14.712    | <b>新新</b>    | Levrice.      | $\epsilon^{(i)})$ | 1 contraction                            |
| 3.          |  |             |   | Mar Alexandre                            |                |  | SOP Check List                                   |          | 1609              |                              | 1113908     |              | 52.55     | ala di<br>Ng | 1. 30 d       | 1999              | 1.15%                                    |
|             | 行行的  | 12.32       |   | and the second                           |                |  | Preventive Maintenance Record                    | 1483     | e crayes          |                              | 1002.4      | in the       | 18:34     | 3-63         | 1.5.          | 144               | 1  |
| T           | States -   | na na       | NEWS  | CARGE !!                                 | 1945799        | 50.4.57                                      | Daily Operation Record                           | 250      | 3.52              | 1992                         | 1. 784 E. 1 | a the        | 15.25     | Bark         | 1000          | (2m)              | 1819                                     |
|             | $F_{in} = \frac{1}{2} \left[ $ | a finder    |   |  | 1851455        |  | SOP Check List                                   |          |                   |                              | 5.56        |              | - 1622    |              | 162           | 13                | 188                                      |
|             |  |             | 22.20   |  | 网络新教           |  | Preventive Maintenance Record                    | 1. Sala  | o lagres          | 12.2                         | 2132        | 19.25        | 17.20     | 0212         |               | 188               | 100                                      |
| T           | and the second se  | 1.15192.151 | in Charles                                      | Stript)                                  | State State    | -lating                                      | Daily Operation Record                           | 3/0      | $\neg \phi Z^{*}$ | -73/21                       | 8.251       | 7.80<br>1.00 | 1.100     | 354          | 8.7%          | 128               | 1 1.770                                  |
|             | No. Ala  |             |   |  |                |  | SOP Check List                                   |          | 332               |                              | 6.13        |              | 282       | 1.20         | 3/18          | 1.15              | 1.22.2                                   |
|             |  |             |   | 124-8                                    |                |  | Preventive Maintenance Record                    | 1999 B.  | 82%               | 1353                         | 3.47        | 110          | a since   | (Trail       | 1.08427       | 02(3)             | 1983                                     |
| T           | 167.5.4.19 S   | Sec. Bar    | 1.4   | 1919-02                                  | and the second | Past 12                                      | Daily Operation Record                           | 18       | s aist            | 1 Sec                        | - Segura    | 535          | 1999      | 1325         | Stark.        | 1                 |  |
|             |  | 12 22 2     |   | 100                                      | Sec.           |  | SOP Check List                                   |          |                   | in the second                | 100         |              | 1.000 (M) | 1218         | 1.5           |                   |  |
|             |  |             | and the   | Mar 13                                   | Sec. W.        |  | Preventive Maintenance Record                    | Press.   | 122.74            |                              | 4.5%        | 1-20         | 1. 2018   | 1943         | 2.45%         |                   | 1338                                     |

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Approved by

WASA: GRW

Division: III (Model Town) Sub Division: B. (Alam chowk)

Prepared by Shakees Ahmanl.

| 1 16        |  | Adm                       | inistrative  | Informatio  | n            | ( 10 10 10 10 P | 136 ) di Compositione de      | 1 m                 | 20                                       | 16       |                    |          |   | 20               | 017       |          |                |
|-------------|--|---------------------------|--|---|--------------|-----------------|-------------------------------|---------------------|--|----------|--------------------|----------|---|------------------|-----------|----------|----------------|
| -           | 1  |                           |  |   |              | e su des ser a  |                               | N                   | lov                                      | D        | ec                 | J        | an  | F                | eb        | N        | lar            |
| Site<br>No. | Loc  | ation                     | Nam  | e of the P  | ersons in C  | harge           | Contents of Activity          | Planning            | Completed                                | Plenning | Completed          | Planning | Completed   | Planning         |           | Planning | 10-0           |
|             | Sub Division   | Site Name                 | XEN  | SDO   | Sub Engineer | Operator        |                               | Dete                |  | Dete     | Compared           | Dete     | Competes  | Planning<br>Date | Completed | Dete     | Completed      |
| 11          | in an and  | S. Take                   | $E_{n}^{(1)} = E_{n}^{(1)} = $ |   | Road States  |                 | Daily Operation Record        | S. A. P.            | Same -                                   | 1.1.1    |                    |          | 1 Sign  | E. M.            |           | 100      |                |
| 1.          | E III  | Camp No.2                 | Kashan   | M. Igbal  | Shakeel      | 0.0             | SOP Check List                | 29                  | C. March                                 |          | Set Che            |          | 1.1400  |                  | 175-875   |          | 1824           |
|             |  | · 小学学生的(学)。<br>- 小学学校(学)。 | ATSIL  |   | Ahmad.       | Salman          | Preventive Maintenance Record | NON                 | 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1 | - ACM    | -181               | 重新       | a de la   | 12.13            | 1344      |          | Sec. Willi     |
|             | Sau West   | 18367                     | Sec. 1   | 2010  | F. S. Star   | S. Salar        | Daily Operation Record        | 105.3               | Charles                                  | 222      | 1-0.107            | 1.101    | 1.1.1.1.1   | 13.27            |           | 1.15     | 1.131.5        |
| 2           | and the second s |                           |  |   |              | 1987.5          | SOP Check List                |                     | Saturdia .                               | 「お茶」     | 1.05/16            |          | 1000  |                  | 1222      | 125      | a served       |
| ŝ.          | anti filia   |                           | Stand Ser  | A SERVICE   |              | 11-11-11        | Preventive Maintenance Record |                     | 15/25                                    | 1.282    | $\chi_{s}^{2}(2t)$ | 135      | 1.0000  | 1231             | i dinta   | 123      | 129932         |
|             | W Diger  |                           | STORAGE IN   | 282702  | 1234519      | and de          | Daily Operation Record        | EST.                | 1546                                     | 17.85    | -3277-05           | (S. 3)   | 1.<br>1.<br>1.<br>1.<br>1.<br>1.<br>1.<br>1.<br>1.<br>1.<br>1.<br>1.<br>1.<br>1 | - Sec.           | 11:4      | 1000     | 1.26.32        |
| 3.          | 1.1.1  | 1999                      |  |   |              | 157.57          | SOP Check List                | h i più<br>by costa | 1949                                     |          | 120.02             |          | 7858  |                  | 126.3     |          | 1. 1. 1. 1.    |
|             | SEL 3  | 10.284                    |  |   |              |                 | Preventive Maintenance Record | tine.               | Action                                   | int.     | 1.1676.19          | 1000     | 136303  | 1000             | nikus     | 120      | in the         |
| 1           |  | 84.81                     | Margaria.  | 1223  |              | C. S. Sala      | Daily Operation Record        | 8.44                | 1.2.3924                                 | 303\$J   | dines.             | 1.32     | 1.000   | 1985             | 33843     | 1942     | - Starle       |
| 4           |  | 179 51                    | 연말했  |   | Constant of  |                 | SOP Check List                |                     | 5.685                                    |          | $\sim 10^{-10}$    | 125      | 10.00   | 110              | 1         |          | 1.17.1         |
| 1           | 的问题。   | 1995年1月                   |  | $U^{(n)}(\widehat{\mathcal{F}}_{n}^{(n)}) = U^{(n)}(\widehat{\mathcal{F}}_{n}^{(n)})$ |              |                 | Preventive Maintenance Record | the state           | dina.                                    | 1803     | 1.55%              | 1993     | 1.18.19   |                  | 1.202     |          | a stand        |
|             | South Stre   | 10000                     |  | CONTRA-   | 12020        | NAR M           | Daily Operation Record        |                     | 10.2                                     | 12.3     | 0.000              | 1325     | 10.23   | 323              | 1 2002    | 1926     | in agene       |
| 5.          | 1923   |                           |  |   |              | 2,60,52         | SOP Check List                | 192                 | 1. 1996                                  | 122      | 1 5.2.5            | 199      | 1.4.5   |                  | 1.12      |          | 1 29%          |
|             | Part Contractor  |                           |  | Die Beer  |              |                 | Preventive Maintenance Record | and the second      | 1902                                     | Sec. B.  | P. P. Buch         | 1.2.16   | 15 11   | 132              |           |          | 1 29/2         |
| 1           |  | State of the              |  | N. Carl   | 82.25%       | 1953            | Daily Operation Record        | 122                 | 1. Section                               | 125      | 1248               | 1289     | 100000  | 190              |           | 3.0      | 96 A.412       |
| 6.          | Sec. 2   |                           |  |   |              |                 | SOP Check List                |                     | t (Certi)                                |          | 11.200             |          | 0<br>   |                  | 1         |          | S. Marz        |
| 2           | Ser 2 K  |                           |  | The Contraction   | Sand and     | 1200            | Preventive Maintenance Record |                     | 2.578                                    | 10.18    | 1.3.2              | 1953     | - nhi   | 1                |           |          | and the second |

WASA: LHR

Division: Nighter Town-I Sub Division: GIREEN TOWN

Approved by SHAMAS A JOUB Prepared by H. M. RAHEEL

|             |  | Ad           | ninistrative      | Informatio       | - 18-5 1950 Mars    | and the second | SALATING STRATEGY ST. ST.     |          | 20                       | 16       |                |              |             | 20       | 17                 | 1.            | 1.00      |
|-------------|--|--------------|-------------------|------------------|---------------------|----------------|-------------------------------|----------|--------------------------|----------|----------------|--------------|-------------|----------|--------------------|---------------|-----------|
| 1           | 1.1.1.1.1.1.1.1.1  | Autor Autor  |                   | mormatio         | <ol> <li></li></ol> | 8-2-12-25-2    |                               | N        | ov                       | D        | ec             | J            | ari         | F        | eb                 | M             | ar        |
| Site<br>No. | Loca   | ation        | Nam               | ne of the P      | ersons in Cł        | narge          | Contents of Activity          | Plenning | Completed                | Plenning | Completed      | Plenning     | Completed   | Planning | Completed          | Planning      | Completes |
| -           | Sub Division   | Site Name    | XEN               | SDO              | Sub Engineer        | Operator       |                               | Dete     | 1. 10000                 | Dete     |                | Dete         | 1 Sector    | Dete     | 299.0435           | Dete          |           |
|             |  | A            | Tehlag,           | Chamos           | Iman                |                | Daily Operation Record        |          | 9.4                      |          | $= V_{CY}^{*}$ |              |             | -        |                    |               | i inter   |
| 1.          | Greenlown  | 1/meex       | Ishfaq<br>Vienizi | Avil             | JANAAN              |                | SOP Check List                | 29184    | K ala                    | 10-11-1  |                |              |             |          |                    | 1874 S.<br>S. |           |
|             | and a straight of the straight | Chowk        | lionisi           | 17/40            |                     |                | Preventive Maintenance Record | Nov      | ALS ?                    |          |                | 内语行          | 143         |          | - Sister           |               | Keling :  |
| -           | Tenterale.   | 4.2560       |                   | 13 States        | Na State of State   | SHEW?          | Daily Operation Record        | 333      | 1.13775                  |          | These .        | No.          | and a star  |          | 1 Carrie           | 1             | - 7-(3).  |
| 2           | Steve Sta  | S. Sales     | 1.1.1.1           | alling of the    |                     | Sec.           | SOP Check List                |          | $  _{\Omega} \lesssim 0$ |          | Sec. 24        |              | 1.00        | 1450     | 11.785°E           |               | 1.0025    |
|             | William .  | SM PA        | a provide the     | 1.8.8.2.2        | STATES IN           | -1966-1866     | Preventive Maintenance Record | 1922     | 1.1250                   | 125      | April april    | 16-52        | 1.225 1.55  | 1.200    | (b7 <sup>k</sup> ) |               | 1993.84   |
| -           | STA SE   | ASSEM!       | 的情况感受             | 12260            | ((Separt))          | 3.528          | Daily Operation Record        | 120      | \$5.36v                  | 1.65     | a status       | 1.161        | - 123/24    | 1776     | 178.5.5            | 1122          | ( Series  |
| 3.          |  | 532.19       |                   |                  |                     | 1 bisto        | SOP Check List                |          | 05375                    |          | - West         |              | 15787       |          | 12,352             |               | 1.32.35   |
|             | Salata.  | 12.000       | 一般意義              |                  |                     | Sala 3         | Preventive Maintenance Record | 1.20     | 112                      | (Fig.)   | WWW.           | 1.32.80      | - Autor     | 1241     | 1.1.1.2            |               | 1.7594    |
| 1           | ्र अवस्थित्।<br>इ.स. १९४१  | Martin       | 120162            | 1309-13          | 1 martin            | And Standards  | Daily Operation Record        | and the  | 1 april 2                | Var      | 111231         | No.          | 12.5        | - 19     | 17/25              | 124           | 120       |
| 4.          |  |              |                   | Strateger St.    |                     |                | SOP Check List                | 35       | 1.046                    |          | 1.25.07        |              | 119963      |          | 1922               |               |           |
|             | 312.54   |              |                   |                  | S. M. Hall          | 1.2.2.2.2      | Preventive Maintenance Record | 1233     | 1.2.25%                  | 5.8      | 0.12           |              | e (d. St.   | 1.32     | 1.24               |               | i izan    |
| 3           | 1.000  | St. Sec.     | 133213221         | Casta &          | 1.1.2000            | See Aug        | Daily Operation Record        |          | 1.48                     | 100      | 1.2.2          | 1995<br>1995 | and the set | 117.30   |                    |               | 100-5     |
| 5.          |  |              |                   |                  |                     | and produced   | SOP Check List                | 1        | e sere                   | 1000     | 2809           |              | 1 25-1      |          | 1. 1.59            |               |           |
|             | E.C.M.   |              |                   | 12683            |                     | And Store      | Preventive Maintenance Record | EN L     | 1.00                     |          | i ang          | 140          | 1 435       | inger    | 1                  |               | 1 200     |
| 1           | 45,913,0   | gen alger is | 1.201.022         | -<br>Filialiania | 1200 - 1700         | 4.232.75       | Daily Operation Record        | 1 1820   | 1. 834.0                 | 1100     | ( with         | 125          | e 1997      | 123      | 94 . ASE           | 53            |           |
| 6.          |  |              |                   |                  |                     | 100            | SOP Check List                |          | Sporta di                |          | falastal d     | 1. 192       |             |          | 91.0038<br>1       | 1.22          | 197       |
|             | 12335  |              | AN REF.           |                  |                     |                | Preventive Maintenance Record |          | L and                    | 1 80     | Sec.           |              | 2 Sugar     | 1000     | 10000              | 1 323         | 1         |

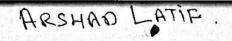
Approved by

Prepared by ADEEL SHARIF

2017 2016 Administrative Information Feb Mar Nov Dec Jan **Contents of Activity** Name of the Persons in Charge Location Planning Dete Planning Date Planning Plenning Date Plenning Site No. Completed Completed Completed Completed Completed Date Sub Division Site Name XEN SDO Sub Engineer Operator Asmaer Tirmy' Shames Chould Sha. Ayob. Daily Operation Record 29 Green Town. 1-1. SOP Check List 2016 -Preventive Maintenance Record **Daily Operation Record** SOP Check List 2. Preventive Maintenance Record **Daily Operation Record** SOP Check List 3. Preventive Maintenance Record **Daily Operation Record** SOP Check List 4. Preventive Maintenance Record **Daily Operation Record** SOP Check List 5. Preventive Maintenance Record **Daily Operation Record** SOP Check List 6. Preventive Maintenance Record

App

WASA: Lahore Division: Nishter town Sub Division: Green Gum.



Approved by

WASA: Multan Division: Disposed Div. Sub Division: South.

|      | and the second                | Ad                        | ninistrative        | Informati      | on Thereaster | weight weight.  | CONTRACT AND CONTRACT         | · · · ·                                  | 20                 | 16       |                                   |                         | 77 10                                     | 20       | 017         | 1.012                               | 1.160                                     |
|------|-------------------------------|---------------------------|---------------------|----------------|---------------|---|-------------------------------|--|--------------------|----------|-----------------------------------|-------------------------|---|----------|-------------|-------------------------------------|---|
|      | Real Production and the       | Au                        |                     | mormati        | Un            |   |                               | N  | lov                | D        | ec                                | J                       | an  | F        | eb          | м                                   | lar                                       |
| Site | Loc                           | ation                     | Nam                 | ne of the F    | Persons in C  | harge   | Contents of Activity          | Plenning                                 |                    | Planning | of contrasts                      | Planning                | 1899                                      | Planning | 11.036      | Planing                             |   |
| No   | Sub Division                  | Site Name                 | XEN                 | SDO            | Sub Engineer  | Operator  |                               | Dite                                     | Completed          | Dete     | Completed                         | Dete                    | Completed                                 | Data     | Completed   | Date                                | Completed                                 |
|      | south                         | 0.                        |                     | 201            | Arshad        | Ghulom  | Daily Operation Record        | 281                                      |                    |          |                                   | 19452<br>19452<br>19412 | 1 1 1 4 4 4<br>1 1 1 4 4 4<br>1 1 1 4 4 4 | No.      | 10.1924S    | 100                                 | 1.1.1.1                                   |
| 1.   | S aller Profession            | Qanim<br>belo             |                     | Anjum          | rati.         | Rosool.   | SOP Check List                | (Beach                                   | 1950               | Park     | 7135                              | 444                     | Call S                                    |          |             |                                     | 1.1.1.1                                   |
|      |                               |                           |                     | Zaman          | 調整の建          | and the second  | Preventive Maintenance Record |  | Sec.               |          | 1416                              |                         | 1215                                      |          | a da        |                                     | all and a second                          |
|      |                               | 1026                      | Defection of        | 1721 VA        | STREET,       | 和性情况  | Daily Operation Record        | 1000                                     | 1.200              | 12/16    | $(\leq, \zeta_{2n})$              | 3.23                    | - 58.3                                    |          | 1.199       |                                     | South a                                   |
| 2    |                               | e in de l'Els<br>De Brits | a Theel             |                | T. Starter    |   | SOP Check List                |  | 100.000            |          | 5.374                             | 148                     | 817.8                                     |          | 122324      |                                     | 1. gt (8.                                 |
| 1    |                               |                           |                     | 17124          | Sec. 2.       | Salar Carl  | Preventive Maintenance Record | an a | 1.53.45-           |          | 2.23                              | 是称                      | 傳合的                                       | 640      | 1.58        |                                     | 1-5-52%                                   |
|      | 法被认为的                         | and the set               | New State           | 网络南方道          | 1002000       | 2.4962  | Daily Operation Record        | 1.467                                    | 58.03              | SER.     | 122                               | 367                     | 16923                                     | 163      | No day      | 1.20                                | 1346                                      |
| 3.   |                               |                           |                     | a stand        |               |   | SOP Check List                |  |                    |          | , 392 <sub>6</sub> ,              |                         | 404                                       | 1280     | Table.      |                                     | $\sim \xi^{\gamma}_{c} e^{-\epsilon}_{c}$ |
|      |                               |                           |                     |                |               | (Red))  | Preventive Maintenance Record | 1992                                     | inter i            | 132      | 2.202                             |                         | 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -   |          | 1.1.1.2     |                                     | 1. 19                                     |
| 1    | lind of the                   | J.S. Sale                 | NE STE              | Westerne.      | 3:072072      | 1920203   | Daily Operation Record        | 10.37                                    | 100                | 12362    | $(\mathcal{T}_{I}, \mathfrak{g})$ | 1212                    | 100                                       | 20       | Times.      | 128                                 | 1.20.2                                    |
| 4.   | 5. 4988<br>1. 1998<br>1. 1998 |                           | 1. W. 19.           |                |               | 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -<br>1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -<br>1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - | SOP Check List                |  | . ayda             |          | 1 4724                            |                         | 12.20                                     |          | 1.1.81      |                                     | 1993                                      |
|      |                               |                           | Martin Star         |                | (1) and       | 1200  | Preventive Maintenance Record |  | 1.18201            | 1.2      | 1.57.41                           |                         | 1.2.2.                                    |          | i nego      |                                     | 1.50                                      |
| 1    | 1946224                       | AN AL                     | 10.2022             | 19.275.274     | 电动动机          | 139 8 2 3   | Daily Operation Record        | har                                      | $(1, 2^{-1})^{-1}$ | - Series | Sall?                             | 19.75                   | 1.7.195                                   | Sector   |             | $= - \tilde{u}_{ij} \tilde{V}_{ij}$ | 123                                       |
| 5.   |                               |                           |                     |                |               |   | SOP Check List                |  | 1972               |          | 1753.0                            |                         | 1.2.50                                    | 19.2     | 1.1328      |                                     | Heren.                                    |
|      |                               |                           | $\{y_i\}_{i \in I}$ |                | 1997          | · Specification   | Preventive Maintenance Record |  | 1200               | 12       | 192.00                            | 135                     | 35  | 100      | in prate ju | 71213                               | Stews.                                    |
| 1    | A. S. S.                      | 1943/07/191               |                     | 11. A. S. 1940 |               | 动动物动物   | Daily Operation Record        |  | 1 (32)             | 1993     | 1.12                              | 1023                    | e l'ar                                    |          |             | 183                                 | 1 196                                     |
| 6.   | 2562.4                        |                           |                     |                |               |   | SOP Check List                |  | 110523             |          | 1.4.1                             | 1.29                    |   |          | 1           | 180                                 | 1 4 10                                    |
|      |                               |                           |                     |                |               |   | Preventive Maintenance Record | M. A.                                    | 53.5               | - Sector | 1. Augite                         |                         | a linga                                   | 133      | 1 362       | 18.20                               | 1420                                      |

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Approved by Prepared by SHAFGAT MALIK Prepared by SHAFGAT MALIK

# WASA: RAWALPINDi Division: BULK W/SUPPLY Sub Division: FILTRATION PLANT

| 1.19        | and the second second | Ada        | inistrativa            | Informatio  | 778.200                                   | Second States of | CONTRACTOR STATES AND ADDRESS |  | 20   | . 16          |               |                  |   | 20               | 017                         |                  |                         |
|-------------|-----------------------|------------|------------------------|---|---|------------------|-------------------------------|--|--|---------------|---------------|------------------|---|------------------|-----------------------------|------------------|-------------------------|
| 100         | of all the set        | Aun        | inistrative            | informatio  | n - se                                    | 2012-1-1765      |                               | ٨  | lov  | 0             | )ec           |                  | lari  | F                | eb                          | N.               | Aar                     |
| Site<br>No. | Loc                   | ation      | Nam                    | e of the P  | ersons in C                               | harge            | Contents of Activity          | Planning   | Completed  | Planning      | Completed     | Planning<br>Data | Completed                                   | Planning<br>Data | Completed                   | Planning<br>Data | Completed               |
|             | Sub Division          | Site Name  | XEN                    | SDO   | Sub Engineer                              | Operator         | 的。但是我的时候,这些理想的正常              | Dete   | Sec. 2010 (24                                    | Dete          | 1000000       | Deta             | 10.00                                       | Deta             | 10.2500                     | Cata             | 1002.51                 |
| 1           |                       | RAWAL LAKE | 12 TRE REAL            | SHAFQAT   | MUHAMAD                                   | Distants.        | Daily Operation Record        | NOV  |  | JAN           | 2 1. 1995     | JAN              | 1-4-3-1<br>1-4-3-1                          | and the          | to a light                  | Mar              | 1.58                    |
| 1.          | 的现在分词                 | FILTRATION | MANZOCK                | MALIK   | ALI                                       | MUKANSOND        | SOP Check List                | 27   | 动动物  | 34 8          | 47 P.S        | 31               | $= \sum_{i=1}^{N-2k} a_i \cdot \frac{1}{i}$ |                  | $\mathbb{E}^{l \geq p_{1}}$ | 10               | 11月11日                  |
| inter-      | Filtrainpla           | RANT       | A Participation        | 1. Enc  | and share                                 | KHALID           | Preventive Maintenance Record |  | $\mathbb{P}_{\ell}(\mathbb{P}_{\mathbb{P}_{1}})$ |               |               | 100.50           | 3 281 /<br>                                 |                  |                             | an The           | and the second          |
| 1           | No. And A.            | 成金額目       |                        |   |   | 102.92.8         | Daily Operation Record        | 12000  | 1997 199   |               | 网络            |                  | 1110903                                     | 8537             | $\{\phi_i\}_{i=1}^{n-1}$    |                  | 1.4.57                  |
| 2           |                       | Nreffel.   | 123                    |   |   | 新聞               | SOP Check List                |  | 26221  |               | 1.228.33      |                  | 10252                                       | Se N P           | 2.5430                      |                  |                         |
| 10.10       | Market .              |            | 1. Section             | (* 6)()33(?)  | ALAN SHALL                                | 网络拉              | Preventive Maintenance Record | South.   | 2835°  | 24            | 195           |                  | - टचा                                       | War              | Sec. 1                      | 58792            | 6628                    |
|             | 1. 200                | "你们是你      | 10223                  |   | (14)100月2                                 | 11152831         | Daily Operation Record        | all the  | 21.75  | 202           | 13247         | 200              | $\mathbb{C}^{n}_{a}(\mathbb{R})$            |                  | [EC(2)]                     | 万家               | 4994                    |
| 3.          |                       |            |                        |   |   | No.              | SOP Check List                |  | 1.8722   |               | 100           |                  | 105237                                      |                  | に場合を                        | 14-              | $f_i^{(j_i)} g_{\mu_i}$ |
|             | and the               |            |                        |   |   |                  | Preventive Maintenance Record | Aller,   | 110.324  | 345           | 189753  <br>1 | 24.24            | and the second                              | anti-            | in the                      |                  | ALMAN .                 |
| 3           | STANDAY.              | (Wag S. C  |                        | "你帮助我们  | 12 Winder                                 | 1995             | Daily Operation Record        | de la composition de la compos | 22.25  | 22            | 182-15-       | 12.74            | \$ 2581                                     | - 1              | 14-54                       | The L            | 1.14.8                  |
| 4.          |                       |            |                        | $\sum_{i=1}^{n} \sum_{j=1}^{n} \frac{1}{2^n} \sum_{i=1}^{n} \frac{1}{2^n} \frac{1}{2^n} \sum_{i=1}^{n} \frac{1}{2^n} \sum_{i=1}^{n} \frac{1}{2^n} \sum_{j=1}^{n} \frac{1}{2^n} \sum_{i=1}^{n} \frac{1}{2^n$ |   |                  | SOP Check List                |  |  |               | 12567         |                  |   |                  | Solo -                      |                  | 244                     |
|             | and the second        | 1992       | a ka                   | Star Care   |   | N. Falter        | Preventive Maintenance Record | 2,202  | 12 July  | ally services | 1873          | 199              | 100   |                  |                             |                  | 25.2                    |
|             | 1.8062020             | 103038801  | TENNE -                | WY DEST   | 1775-1219                                 | app. 24.04       | Daily Operation Record        | 10.35  | t vilster  | 838           | 1,303         | 18               | 1954  |                  | 132                         | 999 L            | 1.23                    |
| 5.          |                       |            | $\tilde{s}^{\mu} d\mu$ |   |   | and a star       | SOP Check List                | (Alternation   | Esca   |               | 128.3.5       | 52               | 1787  | S.L              | NOR I                       |                  | 1100                    |
|             |                       |            |                        | And Tell  |   | 25438.3          | Preventive Maintenance Record | THE R.   | Sec.   | 1.1.4         | 2:21          | 2.242            | 1996  | 120              | 2544                        | 1                | 32.5                    |
|             |                       | 5362.8     | 1214/22                | Thister   | A. S. | S Dest           | Daily Operation Record        | 14.64  |  | 343           | Second a      | 5.375            | 11.12                                       |                  | Section 1                   | 351              | 10.6                    |
| 6.          |                       |            |                        | States 1  |   |                  | SOP Check List                | Sec.   | 7012   |               | 15-47         |                  | Contraction of the                          | L                |                             |                  |                         |
| 1           |                       |            |                        | Survey  |   | a horizon        | Preventive Maintenance Record | 122  | 1992   | 1823          | 60.32         |                  | 1222  |                  | SAL                         | 19913            | 2.1                     |

| w          | <sup>e</sup> Electrica                               | l Panel   |                                      |                |                             |  | on: MaliBazi                  |                  |                |                  | Approv<br>Prepar | red by<br>ed by  | Dire                       | a loz   | _ wo             | Jun ?            | ing<br>er |
|------------|--|---|--------------------------------------|----------------|-----------------------------|--|-------------------------------|------------------|----------------|------------------|------------------|------------------|----------------------------|---|------------------|------------------|-----------|
|            | an ar ar<br>Anna an | and the state of the | ninistrative                         | and a page     | 1 - 200 A. (AM) (21) 78<br> | 1923 (1942) (1943)<br>1936 (1947) (1945) |                               | ang arang        | 20             | 16               |                  | 10               |                            | 20  | 017              |                  |           |
| -          | 1.00   | ation   | T                                    |                | ersons in Cl                | an strend and a                          | Contents of Activity          | 1                | lov            |                  | )ec              | J                | an                         | F   | eb               | N                | ar        |
| ite<br>14. | Sub Division   | Site Name   | XEN                                  | SD0            | Sub Engineer                | Operator                                 | Park Services                 | Planning<br>Date | Completed      | Plenning<br>Date | Completed        | Planning<br>Data | Completed                  | Planning<br>Date  | Completed        | Planning<br>Data | Comple    |
|            |  | VES-  | $= \pi_1 \eta_{n+1} Q_{n+1} Q_{n+1}$ |                | 44 mile me > 10<br>2        | AQ:                                      | Daily Operation Record        | 152              | ec.            | 326              | 1 (1) 2)         | 1.515            | $(\frac{np}{2},\beta_{2})$ | $F = \left\{ \begin{array}{c} 1 & 1 & 0 \\ 0 & 1 & 0 \\ 0 & 1 & 0 \\ 0 & $ | Sec.             |                  |           |
|            | MaliBa   |   | -                                    | ilana          | Ort                         | 01                                       | SOP Check List                | TAN .            | de Car         | 20de             | J 2018           | (2)15            | ling. r                    |   | 1. 2 . 3 . 3 . 3 | a de la          | 1.1       |
|            |  | <b>)</b> *  | Kaizon                               | - To Sun       | Qadir                       | Ahmed                                    | Preventive Maintenance Record | 100              | ester s        | 125.1            | dis.             |                  | in the                     | 一次  | - 18.3-          | - A.7.           | 1.50      |
| 2          | Walk Arts  | 1115 M  |                                      |                | Server and the server       | 100000                                   | Daily Operation Record        | (MAL)            | 1.15.2.2       | 122-04           | 1.0265           | 1753             | These .                    | -   | 1.105            | 1.8.84           | pers.     |
|            |  | VES-H   |                                      |                | 1.                          | M.AL                                     | SOP Check List                | 41.2             | 1 72.023       | 195              | 308.5            |                  | 0.86%                      |   | 27723            |                  | 1.8       |
|            | E. Call  |   |                                      | W. ada         |                             | 3.442.08°                                | Preventive Maintenance Record | 1 222            | 2 addies       | 1.13             | 122294           | 1.22.2           | alege .                    | Star 1  | 1.87.42          | 2013             | 1000      |
| 1          | Sec. 8(3) 51   | Really  | 100000                               | 125.13         | 1000                        | 131502                                   | Daily Operation Record        | 303              | 1.50%          | 3957             | 1100             | 14               | a heady                    | 297   | 2.96             | 1.25             | 1         |
|            |  |   |                                      |                |                             | Sec.                                     | SOP Check List                |                  | 1. 1. 1. 1.    | 193              | Strain.          | 1.85             | 1.58-19                    |   | - prosta         |                  | ÷.        |
|            |  |   |                                      |                |                             | 1999                                     | Preventive Maintenance Record |                  | 10.001         | Sin              | - Service        | 1.546.5          | and the                    | 1.20  | 1. 12 340        |                  | 4.77      |
| 1          | S. Carley  | SC DATE:  | Program                              | ા સંસ્કૃતિ કર  | 1261.25 Min.                | (ALC: MARK)                              | Daily Operation Record        | 43               | 1970 L         | 35/3             | 12,5120          | 1977             | Sec.                       | 1378  | 43.00.4          | MEN              | de la     |
|            | 11210  |   |                                      | 542            |                             |  | SOP Check List                |                  | 127428         | 189              | 0.2323           | 24               | 5,655                      | S.S   | 10153            |                  | 120       |
|            | Sec.   | Angel and   | 2.283                                | State.         |                             | 1925                                     | Preventive Maintenance Record | 51181            | $(2M_{\rm e})$ | 2.53             | 1 (1992)         | 1.12             | and.                       | 182   | Same             | 109              | Shoe.     |
| T          | R.M. L. HIL  | Net Western   | 1.42.20                              | Sec. Sint      | and the second              | 1928                                     | Daily Operation Record        | 1.8%             | 1.57%          | 1238             | 100              | 院的               | 19982                      | 1227  | and the second   | 17153            | - Sec.    |
|            | Tit.   |   | and the                              | 1. 1. 1. 1. 1. |                             |  | SOP Check List                |                  | 1. 181.2       | 1965             | 1/34             |                  | S. C. C. C.                |   | 1.2.2            | 123              | 12        |
|            | N. C. S.   |   |                                      |                |                             |  | Preventive Maintenance Record | 1.1              | S James        | 1924             | 1.00             |                  | in the second              | 184   | 2 1 3 . 17       | 63               | Ear       |
| t          | Nest Sea   | 1945 <i>(</i> 1970) 1   | NEW .                                | 12.65          | States 2                    | grades.                                  | Daily Operation Record        | 1224             | 0577           |                  | 1.2.30           | 12/2             | 1.05                       | 1.55  | 1-100            | 113              |           |
|            |  |   |                                      |                | 「日本市                        | 옷유모말                                     | SOP Check List                | 13               | and the        |                  | 39.7             |                  | and the second             | 1   | The Lose         | 1.2              | 1         |
|            | 1.1.1  | 7. 192 9.   | (1953 F)                             | N. C.          | All and a second            |  | Preventive Maintenance Record | 100              | 1.1.1          | 1.354            | 10 10 10 V       | 1298             | 1953                       |   | i Salat          | 1988             |           |

M. Kamzan.

WASA: Quelle

Division: Zarghan Sub Division: Malibayh

Approved by X EN

Prepared by S. P. O Absan Kujal

| 123         |   | Adr            | ninistrative  | Informatio | on               | Streng Series |                               |                      | 20                 | 16       |                                | Sec.                    |   | 20                               | 17             | 1.10     |              |
|-------------|---|----------------|---------------|------------|------------------|---------------|-------------------------------|----------------------|--------------------|----------|--------------------------------|-------------------------|---|----------------------------------|----------------|----------|--------------|
| -           |   |                | 1             |            |                  | 1.000         | Contants of Asticity          | N                    | lov                | D        | ec                             | J                       | an  | F                                | eb             | N        | lar          |
| Site<br>No. | Loca  | tion           | Nam           | e of the P | ersons in Cl     | harge         | Contents of Activity          | Planning             | Completed          | Planning | Completed                      | Planning                | Completed                                   | Planning                         | Completed      | Planning | Completed    |
|             | Sub Division  | Site Name      | XEN           | SDO        | Sub Engineer     | Operator      |                               | Dete                 | 10.000             | Data     | 1000                           | Dete                    |   | Date                             |                | Dete     | Compiercas   |
| 1           | n de la constante de<br>La constante de la constante de | 1. 新闻          |               | 一般意识       | 13.25            |               | Daily Operation Record        | SALL.                | A. P. Ker          | -23H     | 1-0.1                          |                         |   |                                  | 13455          | 18.6     | 1.8%         |
| 1.          |   |                | Rama          | "Ahsan     | Cardia           |               | SOP Check List                |                      | $\mathbb{R}^{n+1}$ | 15       | South.                         | 44                      | 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1    | $\delta [x_{B}] / [$             | Constant       | 后于       | 1.204        |
|             | Malibash  | NS-11          | Achabai       | Kajeer     | Gadir<br>Shawaw  | Shaib         | Preventive Maintenance Record | 2011年2月              | G                  | Dec      |                                | 1999                    | $(\gamma_{i}, \phi_{i})_{i \in \mathbb{N}}$ | 11月                              | S 1 1 1        | Maga     | 4.5.5        |
| -           | ALTER DA  | 2 de fec       | 15.037 N      | NOR LA     | 038-37251        | 678 394       | Daily Operation Record        | 135                  | 132705             | 2.93     | 1.54780                        | 1205                    | Longe L                                     | 1993                             | 1999 19 19     | 1111     | A State      |
| 2           |   | all all        | Dave          | Shaib      |                  | 國合語           | SOP Check List                |                      | Sale               | 18       | $E_{\rm eff}^{\rm out}(x) = 0$ | 行业                      | S.C.M.                                      |                                  | 1              |          | : * * (47.*  |
|             | Pastonia  | Abdul          | Achori        | Badin'     | -                | Shakoo        | Preventive Maintenance Record | 1998, BA<br>1992, BA | 111.000            | Del      | 1000                           | - Bad                   | and the                                     | i da se                          | The state      |          | 1103302      |
|             | 1.00000000  | 111111         | 100.05        | 143630     | The start of the | 网络常常          | Daily Operation Record        | 17/2                 | 1.12.12            | - AL     | 1.5.49                         | 21882                   | 16:257                                      | 1022                             | Control Sa     | 1945     | Serie.       |
| 3.          |   | and the second | Sector Sector |            |                  | CHERCE .      | SOP Check List                | 13                   | 1.41               | 1 de la  | 1.30 %                         | 124                     | 10.20                                       |                                  | and the second | 128      | 1.06.0       |
|             |   |                | Sec. Notified |            | 网络拉斯拉拉           | 1. Boltzania  | Preventive Maintenance Record | 120                  | 1.000              | 128      | 1000                           | 1998                    | 100000                                      |                                  | 10,000         |          |              |
|             | CE MARY   | 1.3 (3)(%)     | 312 ma        |            | 4255882          | NUTRE TO      | Daily Operation Record        | 850                  | 12002              | 40       | 1996                           | 1774                    | $[1, \chi, \ell],$                          | $\langle \delta B^{(2)} \rangle$ | 1.2.5          | - Hall   |              |
| 4.          |   |                |               |            |                  | 12 19 14      | SOP Check List                |                      | 03.52              | 100      | $c_{i}(d; i; T)$               |                         | 125.1                                       |                                  | 1.00           |          | 1.1.2        |
| ÷           |   |                |               |            |                  | and the       | Preventive Maintenance Record |                      | (Select            | 1923     | irna.                          | in these                | 35736                                       | in fin                           | N.C.           | 122      | 1000         |
|             | A STRAGE  | 611.000        | 153. A.E.     | 244.2.8    | 经运行工具            | 223645        | Daily Operation Record        | 32                   | 13.0843            | 36       | 1.25%                          | - dia                   | 111236                                      | 1213                             | 1.8.82         | 2.8      | 1.87         |
| 5.          |   |                |               |            | al end.          |               | SOP Check List                |                      | 1.285              |          | 1980                           |                         | 1 7822                                      |                                  | No.            | 133      | la la comuna |
|             |   |                |               |            |                  | S. March      | Preventive Maintenance Record |                      | - 8(*)(c)          | 1. 393.  | 12.00                          |                         | (325-1                                      | 1333                             | 13.8           | 1920     | is parties   |
|             |   | Series and     | 1.112.2       |            | 150.96.42        | -416-12LP     | Daily Operation Record        | 1.3                  | 12734              | - 3946.) | - 35k -                        | 1.3%                    | 1.3035                                      | 1.<br>1999 y                     | 15-3           | 2.3      | 1 2.65       |
| 6.          |   |                | Sec. 4        |            |                  |               | SOP Check List                |                      | -bstate            |          | 1 5/ 3                         |                         |   |                                  |                | 125      | 1.1          |
|             |   | and the second |               | 24 2 m 3   | 1.11             | Por dest      | Preventive Maintenance Record |                      | a tigo             | -387.23  | 1.0120                         | 1996)<br>1996)<br>1997) | 10013                                       |                                  | 1.57%          | 1.01     | 1.00         |

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Approved by Jaraid Taybal Jadan XE. Prepared by H. Fanaz Ali WASA: Division : Sub Division: MA Sidtho 2016 2017 Administrative Information Nov Dec Jan Feb Mar **Contents of Activity** Name of the Persons in Charge Location Site Planning Date Planning Date Planning Date Planning Date Planning Date Com Completed Completed Completed Completed Sub Division Site Name XEN SDO Sub Engineer Operator **Daily Operation Record** 0 0 ε Mohama TMA Ahatla Jourid Zabour Tonag Jan Mas 1. Astriz Bojwa SOP Check List Nov 0 0 0 water 29/bal chadas cialkot 31 8 29 work's 0 6 Ali **Preventive Maintenance Record** 0 **Daily Operation Record** TUDE WOR shahati 2. 11 SOP Check List Rangpun **Preventive Maintenance Record Daily Operation Record** TUBe Wet 3. 1 SOP Check List Lambiyan Baniyan Kangfura **Preventive Maintenance Record Daily Operation Record** 11 SOP Check List 4. Preventive Maintenance Record **Daily Operation Record** SOP Check List 5. **Preventive Maintenance Record Daily Operation Record** SOP Check List 6. Preventive Maintenance Record

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Annex 3.60 OJT Implementation Procedure 2 for O&M of Electrical Equipment in Fall 2016

| of          | Generator    |  |                         | and and and  | ASTC 1.)AT           | <b>F</b> <i>q</i>                       |    | Approved by                                    | Put "O" w<br>conplete th |   |
|-------------|--------------|--|-------------------------|--|----------------------|---|----|--|--------------------------|---|
| VA          | sa FAIS      | ALABAD   |                         | Division : M   | ANAGEMEN             | T (EAST)                                | )  | Prepared by                                    | i san ka ili shika       |   |
|             |              | Ad   | ministrative l          | formation  | and the state of the | - 14 - 14 - 14 - 14 - 14 - 14 - 14 - 14 | 10 | · · · · · · · · · · · · · · · · · · ·          | Contraction (L)          | •   |
| Site<br>No. |              | sation   | 1967-1987-1987 <b>N</b> | ame of the Pe  | ersons in Char       | ge - Carro                              |    | Contents of Activity                           | Planning<br>Date         | Complete  |
|             | Sub Division | Site Name  | XEN                     | SDO  | Sub Engineer         | Operator                                | 38 |  | Duto                     | 26-19-18-14<br>19-19-18-14  |
|             |              |  |                         |  |                      |   | 1. | O&M Manual                                     | 20-12-16                 |   |
| 1.          | EAST         | PS-31  | KAMRAN                  | SALMAN   | TAHER<br>SHABBER     | Asghare                                 | 2. | Basic Specification<br>➡Vender, Type, Capacity | 20-12-16                 | $\begin{array}{c} (\gamma^{*}, \mathcal{A}_{X}^{*}) (\gamma^{*}) \\ \mathcal{A}_{X}^{*} (\gamma^{*}, \mathcal{A}_{X}^{*}) \\ \mathcal{A}_{X}^{*} (\gamma^{*}, \mathcal{A}_{X}^{*}) \\ \mathcal{A}_{X}^{*} (\gamma^{*}, \mathcal{A}_{X}^{*}) \\ \mathcal{A}_{X}^{*} (\gamma^{*}, \mathcal{A}_{X}^{*}) \end{array}$ |
| 212215      |              |  | [ <b>AAA</b>            | HACHML   | SUUDOL               |   | 3. | Daily O&M Record                               | 20-12-16                 |   |
| ANTE R      |              |  |                         |  |                      |   | 4. | Preventive Maintenance Plan                    | 20-12-16                 |   |
|             |              |  |                         |  |                      |   | 1. | O&M Manual                                     | 312-14                   |   |
| 2           | EAST         | MAN SOORA-   | KAMRAN<br>RAZA          | HASHME   | SHABBER              | ADNAN                                   | 2. | Basic Specification<br>➡Vender, Type, Capacity | 30-12-16                 |   |
| 2.          |              | BAD  |                         |  |                      |   | 3. | Daily O&M Record                               | 25-12-16                 |   |
|             |              | and and an and a second se |                         |  |                      |   | 4. | Preventive Maintenance Plan                    | 25-12-16                 |   |
| STATES -    |              |  |                         | SALMAN   | TAHER                |   | 1. | O&M Manual                                     | 05-01-17                 |   |
|             | EAST         | ABDULLAHP  | KAMRAN<br>K RAZA        | HASHMI   | SHABBER              | ADNAN                                   | 2. | Basic Specification<br>➡Vender, Type, Capacity | 05-01-17                 |   |
| 3.          |              |  |                         | al de la companya<br>San San San San San San San San San San |                      |   | 3. | Daily O&M Record                               | 25-12-16                 |   |
| 1           |              |  |                         |  |                      |   | 4  | Preventive Maintenance Plan                    | 25-12-16                 |   |

### OJT Implementation Procedure for O&M Manua Record Keeping & Preventive Maintenance Act Vity of Generator

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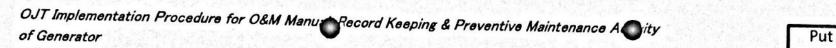
WASA

Division :

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SHAFQAT MEHMOOD MALIK Prepared by

|             |                  | A                                      | iministrative I | nformation   |               |           | APPENDING STREET STREET STREET STREET             | the control of production and the second | . merele to the   |
|-------------|------------------|--|-----------------|--------------|---------------|-----------|---|--|---|
| Site<br>No. |                  | ation                                  | ang salina N    | ame of the P | ersons in Cha | rge       | Contents of Act                                   | ivity Planning Date                      | Completed   |
|             | Sub Division     | Site Name                              | XEN             | SDO          | Sub Engineer  | Operator  | ARAD VILL VERSIONALISE PER                        | atentificaelidika (de <b>Paris</b> , E   | a la serie de l<br>La serie de la s   |
|             |                  |  |                 |              |               |           | 1. O&M Manual                                     | 16-01-2017                               |   |
| 1.          |                  |  |                 |              |               |           | 2. Basic Specification<br>⇒Vender, Type, Capacity | 20-01-2017                               |   |
|             |                  | RAWAL LAKE<br>FRIRATION<br>PLANT RAWAL | M. AHMED        | SHAFQAT      | MUHAMMAD      | MUHHAMMAD | 3. Daily O&M Record                               | 07-02-2017                               |   |
| and a       | Filtration PLant | DAM ISBD                               | MANZOOR         | MEHMOOD      | HL.           | XAMEEN    | 4. Preventive Maintenance Pl                      | an<br>06-03-2017                         |   |
| the state   |                  |  |                 |              | 認識            |           | 1. O&M Manual                                     |  |   |
| 2.          |                  |  |                 |              |               |           | 2. Basic Specification<br>⇒Vender, Type, Capacity |  | Paljar.   |
|             |                  |  |                 |              |               | E and a   | 3. Daily O&M Record                               |  | $\mathcal{I}_{\alpha}^{(*,*)} = \sum_{i=1}^{n} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n}$ |
|             |                  |  |                 |              |               |           | 4. Preventive Maintenance Pl                      | an                                       |   |
|             |                  |  |                 |              |               |           | 1. O&M Manual                                     |  |   |
|             |                  |  |                 |              |               |           | 2. Basic Specification<br>⇒Vender, Type, Capacity |  |   |
|             |                  |  |                 |              |               |           | 3. Daily O&M Record                               |  |   |
|             |                  |  |                 |              |               |           | 4. Preventive Maintenance P                       | lan                                      |   |



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WASA GRW.

Division: III (B)

Approved by

4. Preventive Maintenance Plan

Prepared by SHAKEELAHMAD.

|                           | The second s | Ac                        | ministrative I | nformation    |   |  | 1  |  |          | V  |
|---------------------------|--|---------------------------|----------------|---------------|---|--|----|--|----------|--|
| Site<br>No.               |  | cation                    | 200-10245 N    | ame of the P  | ersons in Char  | rge  |    | Contents of Activity                           | Planning | 0  |
|                           | Sub Division   | Site Name                 | 1.428.424.42   |               |   |  | 1  |  | Date     | Completed  |
|                           |  | Tube Well                 | Kashan         | m.            | Shakeel   | M .  | 1. | O&M Manual                                     | 03 Dec   | $\left\{ \begin{array}{c} \phi & \phi \\ \phi & $ |
| 1.                        | Alam<br>Chowk  | Tube Well<br>Camp<br>No.2 | Hafeez         | Jaybal        | Ahmad   | Salman   | 2. | Basic Specification<br>➡Vender, Type, Capacity | 03 Pec   |  |
| Contraction of the second | TTT (B)  |                           | 00             |               |   |  | 3. | Daily O&M Record                               | 03 Dec   |  |
|                           |  |                           |                |               | and the second  | A CALL AND A CALL  | 4. | Preventive Maintenance Plan                    | 03 Dec   |  |
|                           |  |                           |                |               | $\left  \begin{array}{c} \frac{1}{2} \\ \frac{1}{2$ |  | 1. | O&M Manual                                     |          |  |
| 2.                        |  |                           |                |               |   |  | 2. | Basic Specification<br>➡Vender, Type, Capacity |          |  |
|                           |  |                           |                |               |   | 1997 - 19 | 3. | Daily O&M Record                               |          |  |
| nister h                  |  | and and S                 |                |               |   |  | 4. | Preventive Maintenance Plan                    |          |  |
| 1                         |  |                           |                |               |   |  | 1. | O&M Manual                                     |          |  |
|                           |  |                           |                |               |   |  | 2. | Basic Specification<br>➡Vender, Type, Capacity |          |  |
|                           |  |                           |                |               |   |  | 3. | Daily O&M Record                               |          |  |
|                           | 164.8 5 7 8  | AND ALL A                 | State Care     | rattle son in | 1.5.0 M 3.4 M   | North Although   |    |  |          |  |

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| No.        | Sub Division | ation<br>Site Name | XEN  | ame of the Per                         | Sub Engineer | Operator   | Contents of Activity                              | Date   | Completed  |
| 14         |              |                    |  |  |              |  | 1. O&M Manual                                     | 15 Jan   |  |
| 1.         |              |                    |  |  |              |  | 2. Basic Specification<br>➡Vender, Type, Capacity | ISJan  |  |
| 10.00      |              |                    |  |  |              |  | 3. Daily O&M Record                               | 20 Jav   |  |
| 2.4.5      | Malibagh     | YS-11              | Zarghoon   | Ahsan keja                             | Qudix        | Nasi   | 4. Preventive Maintenance Plan                    | 23Jan.   |  |
|            |              |                    |  |  |              |  | 1. O&M Manual                                     |  |  |
| 2.         |              |                    |  |  |              |  | 2. Basic Specification<br>➡Vender, Type, Capacity |  |  |
| -          |              |                    |  |  |              |  | 3. Daily O&M Record                               | Kasala (1946) (1947)<br>Maria (1947)<br>Maria (1947) |  |
| Sherring a |              |                    |  |  |              | 1  | 4. Preventive Maintenance Plan                    |  |  |
| 10.000     |              |                    |  |  |              |  | 1. O&M Manual                                     |  |  |
| 3.         |              |                    |  |  |              |  | 2. Basic Specification<br>➡Vender, Type, Capacity |  |  |
| 5.         |              |                    | A second se |  |              |  | 3. Daily O&M Record                               | 241 1222   | and the second   |
| 1          |              |                    |  |  |              | All and a second | 4. Preventive Maintenance Plan                    |  |  |

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| Site<br>No. | Loc          | ation                     |                | ame of the Pe   | rsons in Char                      | go             |       | Contents of Activity   | Planning | Completed      |
|             | Sub Division | Site Name                 | XEN            | SDO             | Sub Engineer                       | Operator       | 100   | and the second | Date     | 2012/2014/2014 |
| 102.201     | Johar        | Sakhi                     | Sohail         | Salman<br>Nisax | Hassan                             |                | 1.    | O&M Manual   | 06-12-16 |                |
| 1.          | Town         | Chowk<br>T/W              | Qadix          | Misar           |                                    | I MATAS        | 2.    | Basic Specification<br>➡Vender, Type, Capacity   | 07-12-16 |                |
| の方法         |              |                           | and the second |                 |                                    |                | 3.    | Daily O&M Record   | 06-12-16 |                |
| T.R.M       |              |                           |                |                 |                                    |                | 4.    | Preventive Maintenance Plan  | 10-12-16 |                |
| ではない        | Dreinese     | Director                  | Adeel          | m. Zone         |                                    |                | 1.    | O&M Manual   | 08-12-1  | 6              |
| 2           | OFF.         | Disector<br>Oraing<br>off | storif         | Rowa            | Ayoz                               | Abdullah       | 2.    | Basic Specification<br>➡Vender, Type, Capacity   | 08-12-16 |                |
| Key.        |              |                           | 100            |                 | Hawit                              |                | 3.    | Daily O&M Record   | 08-12-16 |                |
| 10.0        |              |                           |                |                 |                                    |                |       | Preventive Maintenance Plan  | 10-12-11 |                |
| 1.554       |              |                           |                |                 |                                    |                | 1.    | O&M Manual   |          |                |
| 3.          |              |                           |                |                 |                                    |                | 2.    | Basic Specification<br>➡Vender, Type, Capacity   |          |                |
| 5.          |              | Degue C                   |                |                 |                                    |                | 3.    | Daily O&M Record   |          |                |
| ALC: N      |              |                           |                |                 |                                    |                | 4.    | Preventive Maintenance Plan  |          |                |

| O.<br>of    | IT Implement<br>Generator | tation Procedu                 | ire for O&M     | Manua      | ord Keeping &          | Preventive | Maintenance AcOty                                 | Put "O" w<br>conplete the |  |
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| w           | SA LA                     | HOFE                           |                 | <b>D</b>   | XEN (Orm               | -1)COT     |   | MAD KHAN                  |  |
|             | isa ler                   | 110 F C                        |                 | Division : |                        | 1.7461     | Prepared by Nawa2-                                | Abdul Aziz                | V  |
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| Site<br>No. |                           | cation                         |                 | 1          | ersons in Char         | go seren i | Contents of Activity                              | Planning<br>Date          | Complete   |
| 1320        | Sub Division<br>Gul Shom  | Site Name<br>Galshon<br>e-Ravi | XEN<br>Shohail  | Sho Kat    | Sub Engineer<br>Saceed | Nawo2      | 1. O&M Manual                                     | OSDEC                     |  |
| 1.          | e-Roui                    | 0 20021Q                       | Aslom           | NCi.       | Ahmad                  |            | 2. Basic Specification<br>→Vender, Type, Capacity | 05DEC                     |  |
| 「四日日日」      |                           | station                        | Storicinus      |            |                        |            | 3. Daily O&M Record                               | os de c                   | $\sum_{\substack{i_1,\ldots,i_n\\i_1,\ldots,i_n\\i_n,\ldots,i_n\\i_n,\ldots,i_n\\i_n,\ldots,i_n\\i_n,\ldots,i_n\\i_n,\ldots,i_n}} \frac{\psi_{i_1}(q_1)}{q_{i_1}}$ |
|             |                           | Contraction of the second      |                 |            |                        |            | 4. Preventive Maintenance Plan                    | 10 DEC                    |  |
|             | 14 - 56 (10)<br>- 56      |                                |                 |            |                        |            | 1. O&M Manual                                     | 346 <i>3.</i> 446         |  |
| 2.          |                           |                                |                 |            |                        |            | 2. Basic Specification<br>→Vender, Type, Capacity |                           | aangere<br>Gaart   |
| 25.2        |                           |                                |                 |            |                        |            | 3. Daily O&M Record                               |                           |  |
| A. I. M.    |                           |                                |                 |            |                        |            | 4. Preventive Maintenance Plan                    |                           |  |
|             |                           |                                |                 |            |                        |            | 1. O&M Manual                                     |                           |  |
| 3.          |                           |                                |                 |            |                        |            | 2. Basic Specification<br>→Vender, Type, Capacity |                           |  |
| 1 1 1 1 1 1 |                           |                                |                 |            |                        |            | 3. Daily O&M Record                               |                           |  |
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| WA          | sa Lah                     | ore           |                  | Division : | Gulber         | .d         | Approved by Rafie<br>Prepared by Anuc             | que Ch<br>m.Javed                | -                     |
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| Site<br>No. | Loca                       |               |                  |            | rsons in Charg | ge .       | Contents of Acti                                  | ivity Planning Date              | Completed             |
| 1           | Sub Division               | Site Name     | XEN              | SDO        | Sub Engineer   | Operator   | 1. O&M Manual                                     | 5-12-16                          |                       |
| 1.          | Gulberg                    | G-5           | Danish           | Anjad      |                |            | 2. Basic Specification<br>⇒Vender, Type, Capacity | 7-12-16                          |                       |
|             |                            |               |                  |            |                |            | 3. Daily O&M Record                               | 8-12-10                          |                       |
|             |                            | and a realise |                  |            |                |            | 4. Preventive Maintenance Pl                      | lan 10-12-16                     |                       |
| 1           |                            |               |                  |            |                |            | 1. O&M Manual                                     |                                  |                       |
| 2.          |                            |               |                  |            |                |            | 2. Basic Specification<br>⇒Vender, Type, Capacity |                                  |                       |
|             |                            |               |                  |            |                |            | 3. Daily O&M Record                               |                                  |                       |
|             | 36.79-                     |               |                  |            |                |            | 4. Preventive Maintenance Pla                     | an                               | Marine (†<br>Gestrade |
|             |                            |               |                  |            |                |            | 1. O&M Manual                                     |                                  |                       |
|             |                            |               |                  |            |                |            | 2. Basic Specification<br>⇒Vender, Type, Capacity |                                  | 17764                 |
|             |                            |               |                  |            |                |            | 3. Daily O&M Record                               |                                  |                       |
|             |                            |               |                  |            |                |            | 4. Preventive Maintenance Pla                     | in                               |                       |

| O.<br>of  | IT Implement<br>Generator  | ation Procedu  | ure for O&M N   | Manual <b>S</b> ecol  | rd Keeping &  | & Preventive N | Approved by S. Q. O.                              | Put "O" whe<br>conplete the a |           |
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| WA        | SA Mult                    | <b>a</b> ~     |                 | Division : 🄊  | isposal       |                | Prepared by Muhamma                               | d Ar Gad Later                | JL.       |
| -         | an agent of a ministration | A              | dministrative I |   | u serence     | and the second |   | contristical morely           | V         |
| Site      | Loc                        | ation          |                 | ame of the Pe   | ersons in Cha | rge            | Contents of Activity                              | Planning                      | Completed |
| No.       | Sub Division               | Site Name      | XEN             | SDO   | Sub Engineer  | Onerstor       | The second second second second second            | Date                          | Completed |
|           | south                      | Qarim<br>bella | Mr.19htia       |   |               | C. Part P.     | 1. O&M Manual                                     | 13 pec-                       |           |
| 1.        |                            | bella          |                 | Anjours   | Arshoud       | Ghulam         | 2. Basic Specification<br>⇒Vender, Type, Capacity | 13 Dec.                       |           |
|           |                            |                |                 | Zamoin  | ant.          | denorate a     | 3. Daily O&M Record                               | 13 Dec.                       |           |
| Server .  |                            |                |                 |   |               |                | 4. Preventive Maintenance Plan                    | 13 Dec.                       |           |
|           |                            |                |                 |   |               |                | 1. O&M Manual                                     | 14 Dec.                       |           |
| 2.        | south                      | Gorden         | mristiaq        |   | Aslad         | Amour          | 2. Basic Specification<br>⇒Vender, Type, Capacity | 14 Dec                        |           |
| 1.54      |                            | Govden<br>Town |                 | Anjom<br>Zamon  | Locty:        | Inbol          | 3. Daily O&M Record                               | INDEC.                        |           |
| 19. 200   |                            |                |                 | $\begin{bmatrix} \lambda_1 & & \\ 0 & \\ 0 & \\ 1 \end{bmatrix} = \begin{bmatrix} 1 & \lambda_1 \\ 0 \\ 0 \\ 0 \end{bmatrix}$ |               |                | 4. Preventive Maintenance Plan                    | IMDE.                         |           |
| Series of |                            |                |                 |   |               |                | 1. O&M Manual                                     |                               |           |
| 3.        |                            |                |                 |   |               |                | 2. Basic Specification<br>⇒Vender, Type, Capacity |                               |           |
| 100       |                            |                |                 |   |               |                | 3. Daily O&M Record                               |                               |           |
| Sec. 1    |                            |                |                 |   |               |                | 4. Preventive Maintenance Plan                    |                               |           |

| WA          | ISA MOL                             | TAN               |                  | Division :            |                 |          |    | Approved by XEN Disposed<br>Prepared by UMAIR ASG  |                   | 4  |
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| 192         | n sterne en serveren.<br>Television | - Urit 24 an in a | Administrative I | nformation            |                 |          |    | and the second of the second of the second | Planning          | 40.22870                                 |
| Site<br>No. | Loc                                 | ation             |                  | ame of the Pe         |                 |          | 10 | Contents of Activity   | Date              | Complete                                 |
| 1           | Sub Division                        | Site Name         | XEN              | SDO                   | Sub Engineer    | Operator | 1. | O&M Manual   | 13/DEC/10         | 9 - 11 - 1<br>- 11 - 1<br>- 11 - 1       |
| - 1090 - N  | Disposal<br>(North)                 | Chungi<br># 9     | Istria of        | Holfiz                |                 |          | 2. | Basic Specification<br>➡Vender, Type, Capacity   | SPECI             | 6  |
| 1.          |                                     |                   |                  | waqas                 |                 |          | 3. | Daily O&M Record   | 3/DEC/16          |  |
| 1           |                                     | Marine Marine     |                  | and the second second | Section and the |          | 4. | Preventive Maintenance Plan  | 20/DEC/           | 6  |
|             |                                     |                   |                  |                       |                 |          | 1. | O&M Manual   |                   |  |
|             |                                     |                   |                  |                       |                 |          | 2. | Basic Specification<br>➡Vender, Type, Capacity   | Constant Starting |  |
|             |                                     |                   |                  |                       |                 |          | 3. | Daily O&M Record   |                   | 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1 |
|             |                                     |                   |                  | 建設                    |                 |          | 4. | Preventive Maintenance Plan  |                   |  |
|             |                                     |                   |                  |                       |                 |          | 1. | O&M Manual   |                   |  |
|             |                                     |                   |                  |                       |                 |          | 2. | Basic Specification<br>➡Vender, Type, Capacity   | - S. 228-24       |  |
|             | 11                                  |                   |                  |                       |                 |          | 3. | Daily O&M Record   |                   |  |
| 1000        |                                     |                   |                  |                       |                 |          | 4  | Preventive Maintenance Plan  | EN PRIMARY        | the de                                   |

Annex 3.61 OJT Implementation Procedure 3 for O&M of Electrical Equipment in Fall 2016

Approved by SHAFQAT MEHMOOD MALIK

WASA: RAWAL Pinoi

Division : Filtraiim PLant

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| Sha<br>Na. | Loc               | ation        | Nan          | ne of the P  | ersons in Ch                           | arge               | Contents of Activity         | Planning<br>Data | Completed   | Plenning<br>Date | Completed     | Planning<br>Date             | Completed  | Planning<br>Date | Completed  |
| _          | Sub Division      | Site Name    | XEN          | SDO          | Sub Engineer                           | Operator           | 局限公共运动 动力的现在分词 点面的           | the sources      | Succession. | Section of       | 2.35925       | Pro Course<br>e Solari Garri | Magna Ba   | Contractor       | LE CORDEL  |
| A          |                   |              |              |              |  |                    | 1. 5S Activity               |                  |             |                  |               |                              | A State  |                  |  |
| 1.         |                   | RAWAL        | Abound       | SHAFONT      | MUHADADAD                              | Khalid             | 2. Improve PPE/First Aid Kit |                  |             | 25               | の設定           |                              |  | 該当               |  |
|            | FIPLANE           | FIPLANE      | morzor       | MEHMOUD      | MUHADADAD<br>ALI                       | mehmad             | 3. Job Safety Analysis       |                  |             | 25               |               |                              |  |                  | and a second s |
|            |                   | 1535         |              |              |  |                    | 1. 5S Activity               | A COM            |             |                  | 632           |                              | $\sup_{\substack{\alpha_1,\alpha_2,\dots,\alpha_k\\\alpha_k,\alpha_k\in \mathcal{A}}} \frac{\beta_k}{\beta_k} \frac{\beta_k}{\beta_k}$ |                  |  |
| 2.         |                   |              |              |              |  |                    | 2. Improve PPE/First Aid Kit |                  |             |                  | No.           |                              | an a   |                  | and and y  |
| - 20-07-   |                   |              |              |              |  | 1. C. M. K         | 3. Job Safety Analysis       | 4 26.4           |             |                  |               |                              |  |                  | 1928   |
|            |                   |              |              |              | Sale C                                 |                    | 1. 5S Activity               | 1 135            |             |                  |               | -44                          |  | $[i_1, i_2]$     |  |
| 3.         |                   |              |              |              |  |                    | 2. Improve PPE/First Aid Kit |                  |             |                  |               |                              |  |                  |  |
| the state  |                   |              |              |              |  | 200                | 3. Job Safety Analysis       |                  |             |                  |               | No.                          |  |                  | 1847   |
|            |                   |              | 11 CO        |              |  |                    | 1. 5S Activity               | A Dis            |             |                  |               | 1.28° 48° 1.<br>1983 - 198   | 14.2   | 5454             |  |
| 4.         |                   | S. and S. a. |              |              |  |                    | 2. Improve PPE/First Aid Kit |                  | ]≪.])       |                  | 105           |                              | nasian'i<br>Talàna   |                  |  |
| 14         |                   |              |              |              |  |                    | 3. Job Safety Analysis       |                  | 1951        |                  |               |                              |  |                  | -<br>Tel free<br>Marine  |

Division: Gulberg

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| Approved by | Ch Rafique |
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| 14       | 1992 1. 387                 | Ada                        |  | Informatio | THE STREET                   |          |                              | 2   | 016       | 100/21/20        | 104-04-110-02/201 | T. T. S. L. F.   | 2017      | an selected and              | untrikes (2007) |
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| Site No. | Location Name of the Person |                            |  |            |                              | narge    | Contents of Activity         | Planning<br>Date  | Completed | Plenning<br>Date | Completed         | Planning<br>Date | Completed | Planning<br>Date             | Completed       |
| ¥G.      | Sub Division                | Site Name                  | XEN  | SDO        | Sub Engineer                 | Operator |                              | Date  | -227153   |                  | 752.33            | To Jacob         | 2.766.3   | Date                         | Completed       |
|          |                             |                            |  |            |                              |          | 1. 5S Activity               | 15-12-<br>16  | Con con   |                  |                   |                  |           |                              |                 |
| 1.       | Gulberg                     | G-5                        | Danish   | Amjad      | -                            | -        | 2. Improve PPE/First Aid Kit | a de la desta d<br>La desta de la d |           |                  |                   |                  |           |                              |                 |
| 5 M. W.  | and the second              |                            |  |            |                              |          | 3. Job Safety Analysis       | 15-12<br>16   | Con       |                  | The St.           |                  |           |                              |                 |
| 1        | C.C. C. A.                  |                            |  |            |                              |          | 1. 5S Activity               |   | the l     | -                |                   |                  |           |                              | 500 St.         |
| 2        | -                           |                            |  |            | narah seria<br>Selarah seria |          | 2. Improve PPE/First Aid Kit |   |           |                  | 143               |                  |           |                              |                 |
|          |                             |                            |  |            |                              |          | 3. Job Safety Analysis       |   |           |                  |                   |                  |           |                              |                 |
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|          | 3.                          |                            |  |            | at the second                |          | 2. Improve PPE/First Aid Kit |   |           |                  |                   |                  |           |                              | 1442            |
| -        |                             |                            |  |            | A Strengthe                  |          | 3. Job Safety Analysis       |   |           |                  |                   |                  |           |                              |                 |
|          |                             |                            | and the second second                                |            |                              |          | 1. 5S Activity               | 2   |           |                  | 144 N             |                  |           |                              | 7. S.           |
| 11111    | 4.                          |                            | S. Andrewski, S. |            | and the second               |          | 2. Improve PPE/First Aid Kit |   |           |                  |                   |                  |           |                              |                 |
| No.      |                             |                            |  |            |                              |          | 3. Job Safety Analysis       | 2.4   | Carl I    |                  | 100 6             |                  | See Se    |                              | 199             |

SALMAN AHMED HASHMI WASA: FAISALABAD Division: EAST - WWM

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|               |              | Adm   | inistrative   | Informatio       | n                | eg (ur gelige     |                              | D                | Dec                               |                  | Jan                             |                  | Feb  |                  | Mar   |  |
| Sto<br>No.    | Loca         | ation   | Name of the Persons in Charge   |                  |                  |                   | Contents of Activity         | Planning<br>Date | Completed                         | Planning<br>Date | Completed                       | Planning<br>Date | Completed  | Planning<br>Date | Completed   |  |
| No.           | Sub Division | Site Name   | XEN   | SDO              | Sub Engineer     | Operator          |                              | allah Marada     | 28.955.32                         |                  | 142407                          | 2.4.6 3          | and the  | and there        | 1000000   |  |
| in the second |              |   | Kanven  | Salman           |                  |                   | 1. 5S Activity               | 17               |                                   | •5               |                                 | .5               | Starking.  | 05               |   |  |
| 1.            | East         | PS-31   | Raza  | Salman<br>Hashmi | lahir<br>Shabbir | Asgher            | 2. Improve PPE/First Aid Kit | 28               |                                   | 10               | #644-<br>19-2-19-1<br>19-2-19-1 | 1.               | $\frac{1}{2} \frac{1}{2} \frac{1}$ | 10               |   |  |
| Press in      |              |   | $\left  \begin{array}{c} \partial \left[ \left( \frac{\partial \left[ \frac{\partial \left[ \left( \frac{\partial \left[ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $ |                  |                  |                   | 3. Job Safety Analysis       | 23               | 「たち」                              | 10               |                                 | 10               |  | 10               |   |  |
|               |              | A Magaria Ma<br>Tag   | Konstan   | <u><u> </u></u>  |                  | Shoukat           | 1. 5S Activity               | 20               | 杨阳辉。                              | •5               |                                 | •5               | 1788.<br>1788 -  | .5               | 382   |  |
| 2.            | East         | Elshiabed   | Ree   | Hashmi           | i Shobbir        |                   | 2. Improve PPE/First Aid Kit | 23               |                                   | 10               |                                 | 1-               |  | 1-               |   |  |
| 1             |              |   |   |                  |                  |                   | 3. Job Safety Analysis       | 23               |                                   | 10               |                                 | (•)              |  | (0               |   |  |
| Seattle -     |              |   | Keuvan  | Salman           | Tahir            | Iftikhor          | 1. 5S Activity               | 22               | $\mathbb{E}_{[1,2]}^{\mathbb{E}}$ | ٥٢               |                                 | .۲               |  | 05               | 1283  |  |
| 3.            | tast         | Abdulldy  | Roca  | Hashmi           |                  |                   | 2. Improve PPE/First Aid Kit | 26               | $[\tilde{A}^{n,k,n}_{n-n}]_{L}$   | 1.               |                                 | [*               |  | 10               |   |  |
| - Start       |              |   |   |                  |                  |                   | 3. Job Safety Analysis       | 28               |                                   | ) •              | 323                             | •                |  | 10               | $\begin{bmatrix} e^{i\phi} \vec{q} \\ (e_{iq}) \end{bmatrix}$ |  |
| A Second      | 1. 199.      | PS-42   | Kanran  | Salman           | Tahir            | Hussain           | 1. 5S Activity               | 22               |                                   | 05               |                                 | 05               |  | .5               |   |  |
| 4             | East         | 13-42   | Kaza  | Hashmi           | Shabbir          | Shah              | 2. Improve PPE/First Aid Kit | 26               |                                   | 1.               |                                 | 10               |  | 0                |   |  |
|               |              |   |   |                  | 1                |                   | 3. Job Safety Analysis       | 28               | S.M.                              | 10               |                                 | 10               |  | 0                |   |  |

Approved by Schail Aslom Simcha

## WASA: LAHORE Division: XEN (ORM-) GBT

Prepared by SAEED AHMAD KHAN

|        |                                    | and an an an a |           |        | moto and the second      | and the second second |                              |                       | 016   | 2017               |                  |  |   |               |  |  |
|--------|------------------------------------|----------------|-----------|--------|--------------------------|-----------------------|------------------------------|-----------------------|---|--------------------|------------------|--|---|---------------|--|--|
|        | Administrative Information         |                |           |        |                          |                       | 1 martin and the second      | D                     | ec  | Jan                |                  | Feb  |   | Mar           |  |  |
| R.0    | Location Name of the Persons in Ch |                |           |        | Contents of Activity     |                       | Planning<br>Data             | Completed             | Planning<br>Date  | Completed          | Planning<br>Date | Completed  | Planning<br>Date  | Completed     |  |  |
| 1      | Sub Division                       | Site Name      | XEN       | SDO    | Sub Engineer             | Operator              | Contract and the set of the  | and the second second | 0.2020  | Contraction of the | 1. 20120         | 1  | . The C   | - Hostinger a | 1.197.0080   |  |
|        | Gulshan                            | Skandni        | Sonail    | Shokat | Salead                   | NAWAZ                 | 1. 5S Activity               | 15,<br>pecte          |   |                    |                  |  |   |               | er de Con<br>Constantes<br>Marines   |  |
| 1.     | e-Lavi                             | Calory         | Sindhu    | AUX    | Soleed<br>Atomod<br>Khom |                       | 2. Improve PPE/First Aid Kit |                       |   | 44.6               |                  | ona si panga<br>ang pangan<br>ang pang pangan<br>ang pang pangan<br>ang pangan<br>ang pangan<br>ang pangan<br>ang pangan | $\begin{array}{c} g^{*} \mathcal{K}_{\mathbf{w}, \mathbf{p}}^{(1)} \\ (g^{*} \mathcal{K}_{\mathbf{w}, \mathbf{p}}^{(1)}) \\ (g^{*} \mathcal{K}_{\mathbf{p}}^{(1)}) \\ (g^{*} \mathcal{K}_{\mathbf{p}}^{(1)}) \end{array}$ |               | $\begin{bmatrix} x_{1,1}^{-1} & y_{1} \\ y_{1}^{-1} & y_{2}^{-1} \\ y_{2}^{-1} & y_{2}^{-1} \\ y_{2}^{-1} & y_{2}^{-1} \\ y_{2}^{-1} & y_{2}^{-1} \end{bmatrix}$   |  |
|        |                                    | Carlifold Anna | all a la  |        | A State of the second    |                       | 3. Job Safety Analysis       |                       |   |                    |                  |  | 81 81 d<br>   |               |  |  |
|        |                                    |                |           |        |                          |                       | 1. 5S Activity               |                       | 132   |                    |                  |  | Sector Sec.   |               |  |  |
| 2.     |                                    |                |           |        | Charles .<br>States .    |                       | 2. Improve PPE/First Aid Kit |                       | ings.   | ing and<br>Eingen  |                  |  |   |               |  |  |
| 5 K.P. |                                    |                |           |        |                          |                       | 3. Job Safety Analysis       |                       | Sec.  |                    |                  | in and<br>Politica<br>Cyclina  |   |               |  |  |
| 1.4.12 |                                    |                |           |        |                          |                       | 1. 5S Activity               |                       | $\tilde{\gamma}_{s}^{[Q]}(y)$   |                    |                  |  |   |               | $ \frac{1}{2} 1$ |  |
| 3      | ·                                  |                |           |        |                          |                       | 2. Improve PPE/First Aid Kit |                       | 289   |                    |                  |  | 13 <u>7</u> 0.  |               |  |  |
|        | - Stephen                          |                |           |        |                          |                       | 3. Job Safety Analysis       |                       |   |                    | <i>新加速</i>       |  | 194   |               |  |  |
| 1      |                                    |                |           |        |                          |                       | 1. 5S Activity               |                       | $\{ \begin{matrix} 8 & (2, -) \\$ |                    | Margari<br>March | 643 (17<br>12882 -   |   |               |  |  |
| -      | •                                  |                | And State |        |                          |                       | 2. Improve PPE/First Aid Kit |                       |   |                    | K.               |  |   |               |  |  |
|        | a startest                         |                |           |        | 1.12下方:                  |                       | 3. Job Safety Analysis       |                       | a Constant  |                    |                  |  | 5.3.1   |               | 182  |  |

Approved by M. Zahees Rang

WASA: Labore

Division: XEN (03M-D) N. Town.

| -     | ACT MALLE  |           |  |                  | - Contract of the second | 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1 |                                 | 20           | 016  | 2017        |  |                       |  |                                |                       |
|-------|--|-----------|--|------------------|--------------------------|--|---------------------------------|--------------|--|-------------|--|-----------------------|--|--------------------------------|-----------------------|
|       |  | Adn       | ninistrative                           | Informatio       | n                        |  |                                 | D            | ec   | States -    | an   | Feb                   |  | $\mathbb{P}(\mathbf{r}_{i},d)$ | Mar                   |
| Sto   | Location Name of the Pe  |           |  | ersons in Charge |                          | Contents of Activity                     | Planning<br>Date                | Completed    | Planning<br>Date   | Completed   | Planning<br>Date   | Completed             | Planning<br>Date   | Completes                      |                       |
| Na    | Sub Division   | Site Name | XEN                                    | SDO              | Sub Engineer             | Operator                                 | The surger of the second second | 104.05 (C14) | ्रा संचल्या स्टल्टा भ  | 1000 Pr. 82 | ana karingi ne   | and the second second | Contraction of the   | NP 194000                      | And the second second |
| 200   | Green  | c/1       | Shaway                                 | Stows            | Impan                    | niedeen                                  | 1. 5S Activity                  |              |  |             | Mag C.   |                       |  |                                | 100 Ma                |
| 1.    | Tain   | TIN       | Ayut                                   | Ayorb            | (myan)<br>Qanes          | (cirry ect                               | 2. Improve PPE/First Aid Kit    | 15th         |  |             |  |                       |  |                                | and and and a second  |
| 1 mar | 3000   |           |  |                  |                          |  | 3. Job Safety Analysis          |              | Alexandra Santa  |             | an anglaran an<br>Anglaran anglaran<br>Anglaran anglaran |                       | The states   | 19. 2<br>12. 23<br>13. 20      |                       |
| 1.45  | and the second s |           |  |                  |                          |  | 1. 5S Activity                  |              | 1240   |             |  |                       |  |                                |                       |
| 2     | <ul> <li>All All All All All</li> <li>All All All All All All All All All All</li></ul>  |           |  |                  |                          |  | 2. Improve PPE/First Aid Kit    |              | $\frac{1}{2} \frac{1}{2} \frac{1}$ |             | (Tanga)  |                       | States in the second se |                                |                       |
|       | $\left\{ \begin{array}{c} 1 & 0 \\ 1 & 0 \\ 0 & 0 \\ 0 & 0 \\ 0 & 0 \\ 0 & 0 \\ 0 & 0 \\ 0 & 0 \\ 0 & 0 \\ 0 & 0 \\ 0 \\$  |           | a (Northernal)<br>A State (Northernal) |                  |                          |  | 3. Job Safety Analysis          |              |  |             | ange<br>Anderse  |                       |  |                                |                       |
|       |  |           |  |                  |                          |  | 1. 5S Activity                  |              |  |             |  | 93                    | 124  |                                |                       |
|       | 3.   |           |  |                  |                          |  | 2. Improve PPE/First Aid Kit    |              |  |             |  |                       |  |                                | 3,249 (a)             |
|       |  |           | 作。我们的你<br>第一起的问题                       |                  |                          |  | 3. Job Safety Analysis          |              |  |             |  |                       |  |                                |                       |
|       |  |           |  |                  | 1000                     |  | 1. 5S Activity                  |              |  |             |  | 5-15                  |  |                                | Sale (                |
|       | 4.   |           |  |                  |                          |  | 2. Improve PPE/First Aid Kit    |              | 233  |             |  |                       |  |                                |                       |
| 1.4   |  | 1 46 3 6  |  |                  |                          |  | 3. Job Safety Analysis          |              | 4-1787 I   |             |  |                       |  | 14                             |                       |

WASA: Gigranwale Division: 11

Approved by

| - |     |     | A 1 1  |
|---|-----|-----|--------|
| ( | 60  | 402 | Ahnad. |
| ) | ren |     |        |

|             |                | V                     |   | er Barten den Zeite                     | an a state sa saa           | P 0, 211 (1997) | A STATE OF A | 2                | 016  |                    | 4 (            | 2  | 017                          | i in the second state in the |  |
|-------------|----------------|-----------------------|---|---|-----------------------------|-----------------|---|------------------|--|--------------------|----------------|--|------------------------------|------------------------------|--|
| 1           | 3-92 (405)     | Adı                   | ministrativ   | e Informatio                            | on                          |                 |   | D                | ec   | J                  | an             | For the F                                | eb                           |                              | Mar  |
| 1           | Loc            | Location              |   | Name of the Persons in Charge           |                             |                 | Contents of Activity  | Planning<br>Date | Completed  | Plenning<br>Date   | Completed      | Planning<br>Date                         | Completed                    | Planning<br>Date             | Completed  |
| Site<br>No. | Sub Division   | Site Name             | XEN   | SDO                                     | Sub Engineer                | Operator        | A State of the second state of the second   | Marken Mark      | and the second s | 140.48.400         | e tille garden | 1.1.1.1.1.1.1                            | a national and<br>The second |                              | and the second   |
| 1           |                |                       |   |   |                             |                 | 1. 5S Activity  | to               |  | Ja.,10             |                |  |                              | ·结束:<br>「「「「「」」              | 1998 A.M.  |
| 1.          | T              | Model                 | ? Kashan<br>Hafeez  | m.                                      | Shakeel                     | liagat          | 2. Improve PPE/First Aid Kit  |                  |  | 5a- 15             |                |  |                              |                              |  |
| 101.50      |                | Town                  |   | gyber                                   | Ahned                       | Ali             | 3. Job Safety Analysis  |                  | A CAR  | ja 15              |                | i i i i i<br>Li i i i i<br>Altri i i i i |                              |                              |  |
| 1           | Constant State | and the second second |   | in and a standard and a second standard | o a material an di un Somaa |                 | 1.5S Activity   |                  | 12. 12 B   |                    |                |  |                              |                              |  |
| 2.          | 2.             |                       |   |   |                             |                 | 2. Improve PPE/First Aid Kit  |                  |  |                    |                |  |                              |                              |  |
| 1           |                |                       | in de la composition de la composition<br>de la composition de l<br>de la composition de la |   |                             |                 | 3. Job Safety Analysis  |                  |  |                    | Sept.          | 10                                       | 1223                         |                              | AN ALTA  |
| 1           |                |                       |   | 0205425                                 | <b>北京</b> 英語語語              |                 | 1.5S Activity   |                  | 1935   |                    |                |  | 100                          |                              |  |
| 3           |                |                       |   |   |                             |                 | 2. Improve PPE/First Aid Kit  |                  | $\omega_{\rm g}(\tilde{\omega})$   |                    | 19             |  | Sille -                      |                              | $\frac{d_{1}}{d_{1}} = \frac{d_{1}}{d_{1}} \frac{d_{2}}{d_{1}}$                  |
| the second  |                |                       |   |   |                             |                 | 3. Job Safety Analysis  |                  | 549  |                    | 984 (P)        |  | 33.5%                        |                              | $\begin{bmatrix} n_1 & p_2 \\ p_1 & p_2 \\ p_2 & p_3 \\ p_4 & p_4 \end{bmatrix}$ |
| F           | 10.94.3        | 197 (M. 197           |   |   |                             |                 | 1. 5S Activity  |                  | 议秘.  | States<br>Entrates |                |  |                              |                              |  |
|             | <b>.</b>       |                       |   |   |                             |                 | 2. Improve PPE/First Aid Kit  |                  | 10-200<br>10-2001  |                    |                |  |                              |                              |  |
|             |                |                       |   |   |                             |                 | 3. Job Safety Analysis  |                  |  |                    | 123            |  |                              |                              | 12.24  |

Division: Nighter Juan

Approved by Home RAHEEL

Prepared by

|        | Factory and the proof of the | an Derivation | ang sikanika manaka ka                 | Calification and a series |               |          | Comparison of the sector of the sectors        | 20                  | 016   |                  | performant start | 2                | 017         | a 4.47 11                                | - the - set in part |
|--------|------------------------------|---------------|--|---------------------------|---------------|----------|--|---------------------|---|------------------|------------------|------------------|-------------|--|---------------------|
| 1. 200 |                              | Adn           | ninistrative I                         | information               | n             |          |  | D                   | ec  | J                | lan              | F                | eb          | astrain                                  | Mar                 |
|        | Loca                         | tion          | Name                                   | of the Pe                 | ersons in Ch  | arge     | Contents of Activity                           | Planning<br>Date    | Completed   | Planning<br>Data | Completed        | Planning<br>Date | Completed   | Planning<br>Date                         | Complete            |
| a.     | Sub Division                 | Site Name     | XEN                                    | SDO                       | Sub Engineer  | Operator | and the state of the second states with second | 14 43 ST 1999 8 1 7 | a dia kana dia kana ana ana ana ana ana ana ana ana a | Care Blowley     | The Asian        | 1487 - 12 B      | saltered be | and the property of                      | 14.17 - 20.1<br>1   |
|        |                              |               | (onFAQ                                 |                           | Damar         |          | 1. 5S Activity                                 |                     | 01/01/17  |                  |                  |                  |             |  |                     |
| 1.     | GREEN                        | C-I           | ISHFAQ<br>ITRMZI                       | SHAMAS                    | Qhimk         | *72      | 2. Improve PPE/First Aid Kit                   | 12/12/16            |   |                  | T.C.             |                  |             |  |                     |
|        | Town                         | T/w           |  | ri jour                   |               |          | 3. Job Safety Analysis                         |                     |   |                  |                  |                  |             | an a | a land ar           |
|        |                              |               |  |                           |               |          | 1. 5S Activity                                 |                     |   |                  | 1255             |                  |             |  |                     |
| 2      | 2.                           |               |  |                           |               |          | 2. Improve PPE/First Aid Kit                   |                     | 17.4 K.   |                  |                  |                  |             |  |                     |
|        |                              |               |  |                           | 1.20          |          | 3. Job Safety Analysis                         | the station         |   |                  |                  |                  |             |  |                     |
| T      |                              |               |  |                           |               |          | 1. 5S Activity                                 |                     | 1962  |                  | 15:57            |                  |             |  |                     |
|        | 3.                           |               |  |                           | ing Provident |          | 2. Improve PPE/First Aid Kit                   |                     | 1433  |                  |                  | +                |             |  |                     |
| 10.0   |                              |               |  |                           |               |          | 3. Job Safety Analysis                         | 35 S.S.             |   |                  |                  | 3.4              | 387 di      |  |                     |
|        |                              |               | 1. 20.073                              |                           |               |          | 1. 5S Activity                                 |                     |   |                  |                  |                  |             |  |                     |
|        | 4.                           |               |  |                           |               |          | 2. Improve PPE/First Aid Kit                   |                     | 250   |                  | 52               |                  | 3           | -  |                     |
|        |                              |               | 18 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 |                           |               |          | 3. Job Safety Analysis                         | 1. BEA              | 12221   | 1951             | 1355             | 12 A 14          | 31 19       | 1  |                     |

## Approved by

WASA: MULTAN.

Division: Disposal Division.

Prepared by UMAIR ASCIMAR.

| 1           |              |           |   |           | and we want to be a set of the | Read Providence | modulate space of the strange     | 20  | 016             |                    | and and inspection of                       | 2                 | 017                                   |  |  |
|-------------|--------------|-----------|---|-----------|--------------------------------|-----------------|-----------------------------------|---|-----------------|--------------------|---|-------------------|---------------------------------------|--|--|
|             |              | Adı       | ministrative I  | nformatio | n                              |                 | A State of the second second      | D   | ec              | J                  | an  | F                 | eb                                    |  | har  |
| Site<br>No. | Loc          | ation     | Name  | of the P  | ersons in Ch                   | arge            | Contents of Activity              | Planning<br>Date  | Completed       | Planning<br>Date   | Completed                                   | Plenning<br>Date  | Completed                             | Planning<br>Date   | Completed                                      |
|             | Sub Division | Site Name | XEN   | SDO       | Sub Engineer                   | Operator        | State of the second second second | 1965 - 1969 - 1969 - 1969 - 1969 - 1969 - 1969 - 1969 - 1969 - 1969 - 1969 - 1969 - 1969 - 1969 - 1969 - 1969 - | 3               | Second Co.         | An amount of the                            | a to be we fee of | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | and the second s |  |
| 2           | NOPTH        | Chungi    | Ishtiaq   | Hofiz     | AD<br>Tanna a                  |                 | 1. 5S Activity                    |   |                 |                    |   |                   |                                       |  |  |
| 1.          |              | # ]       | V   | ndla      | Ī                              |                 | 2. Improve PPE/First Aid Kit      |   |                 |                    |   | Serent.           |                                       |  |  |
| ALC: MA     |              | 9         |   |           |                                |                 | 3. Job Safety Analysis            | 15  |                 |                    | and and and                                 | A toka            |                                       | 11 11 11   | -  |
| 1           |              |           |   |           |                                |                 | 1. 5S Activity                    |   |                 |                    |   |                   | $\mathbb{T}_{k}^{p}(t)$               |  | 1.761 (18)<br>2.561 (18)<br>2.561 (18)         |
| 2.          |              |           |   |           |                                |                 | 2. Improve PPE/First Aid Kit      |   | and the second  |                    |   |                   |                                       |  |  |
| 10000       |              |           | $= \frac{\frac{2}{2}}{\frac{2}{2}} \frac{\frac{2}{2}}{\frac{2}{2}} \frac{\frac{2}{2}}{\frac{2}{2}} \frac{\frac{2}{2}}{\frac{2}{2}} \frac{\frac{2}{2}}{\frac{2}{2}}$   |           |                                |                 | 3. Job Safety Analysis            |   |                 |                    | $(\frac{\partial M}{\partial x_{i}})^{1/2}$ |                   |                                       |  | $\sum_{i=1}^{n-1} \frac{(i-1)^{i}}{(i-1)^{i}}$ |
| 1000        |              |           | $L^{(1)}_{\alpha\beta} = \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \right] \right] \right] + \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \right] \right] \right] + \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \right] \right] \right] \right] + \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \right] \right] \right] + \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \right] \right] \right] + \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \right] \right] \right] \right] + \frac{1}{2} \left[ \frac{1}{2$ |           |                                |                 | 1. 5S Activity                    |   |                 |                    |   |                   | 1994-1917<br>1999-1917                |  |  |
| 3.          |              |           |   |           |                                |                 | 2. Improve PPE/First Aid Kit      |   |                 |                    | STR   |                   |                                       |  |  |
| 1000        |              | Starts    |   |           |                                |                 | 3. Job Safety Analysis            |   | 15-16<br>1-16-1 | - Santa<br>Tanggan |   |                   |                                       |  |  |
| 041         |              |           |   |           |                                |                 | 1. 5S Activity                    |   | 242             |                    |   |                   |                                       |  |  |
| 4           |              |           |   |           |                                |                 | 2. Improve PPE/First Aid Kit      |   |                 | Se par             | 323   |                   |                                       |  |  |
|             | 1365         |           |   |           |                                |                 | 3. Job Safety Analysis            |   | and a second    |                    |   |                   | 19-28-20<br>30-5540-                  |  |  |

## Approved by

WASA: Multan

Division: Disposal Stations

Prepared by ARSHAD LATE.

| 10.0        | <ol> <li>Contract de State</li> </ol>          | and the second second | 1   |                   | -            | Construction of the second sec | 20               | 016                           |                  | $= e^{-i \frac{1}{2}} e^$ | 2  | 017                |                  | 540 (m)                                  |
|-------------|--|-----------------------|---|-------------------|--------------|--|------------------|-------------------------------|------------------|--|--|--------------------|------------------|--|
|             |  | Adn                   | ninistrative Information  | on                |              |  | D                | ec                            |                  | an   | F  | eb                 | ~~~              | Mar                                      |
| Site<br>No. | Loca   | ation                 | Name of the F   | Persons in Charge | 57(9)37<br>- | Contents of Activity   | Plenning<br>Date | Completed                     | Plenning<br>Date | Completed  | Planning<br>Date   | Completed          | Planning<br>Date | Completed                                |
| No.         | Sub Division                                   | Site Name             | XEN SDO   | Sub Engineer Ope  | rator        | and the second state of the second  | 5                | 1000 400-0 375                | 102.5.27         | 1.C-87-29  | Construction of the local distance of the lo | 2.9.225            | ave sugar        | 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1 |
|             |  | Gasim                 | mr. Ishtiaq   | Deshad Gula       |              | 1. 5S Activity   |                  |                               |                  |  |  |                    |                  |  |
| ١.          | south  | bela                  | mr. Ishtiaq<br>mr. Anjonn   | Lati Ros          | . 110        | 2. Improve PPE/First Aid Kit   |                  | a chainn<br>Martin            |                  |  |  |                    |                  | 8  |
| North State |  |                       | Zamen   |                   |              | 3. Job Safety Analysis   |                  |                               |                  | TA DIA<br>ANTA<br>MANAGERE   |  |                    |                  | A CARACTER STATE                         |
| N.          |  |                       |   |                   |              | 1. 5S Activity   | 9. 63            | 要認為                           |                  | 232  |  |                    |                  |  |
| 2.          |  |                       | 12000   |                   |              | 2. Improve PPE/First Aid Kit   |                  |                               |                  |  |  |                    |                  |  |
|             |  |                       |   |                   |              | 3. Job Safety Analysis   |                  |                               |                  |  |  | 1799-19<br>19 (12) |                  |  |
| 1           |  |                       |   |                   |              | 1. 5S Activity   |                  | 122                           |                  |  |  |                    |                  | 1229                                     |
| 3.          | STATES AND |                       |   |                   |              | 2. Improve PPE/First Aid Kit   |                  | 1.04-22                       |                  | 122  |  |                    |                  | Andre                                    |
| 10.00       |  |                       |   |                   |              | 3. Job Safety Analysis   |                  |                               |                  |  |  | <u> (26)</u>       |                  |  |
| 1           | Alter  |                       |   |                   |              | 1. 5S Activity   |                  |                               | Sala<br>Sala     |  |  |                    |                  |  |
| 4           |  |                       | in the second |                   |              | 2. Improve PPE/First Aid Kit   |                  |                               |                  |  |  | and the second     | No.              |  |
|             |  |                       |   |                   |              | 3. Job Safety Analysis   |                  | 10 A.Pris<br>A.Pris<br>A.Pris |                  | 1977   | 12   |                    |                  | aler.                                    |

Approved by

Prepared by ADEEL SHARIE.

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|---------------|--------------------|------------------------------|-----------------|----------------------|---|----------|---|---|---|------------------|----------------|------------------|-----------------|------------------|--|
|               |                    | Adn                          | ninistrative    | Informati            | on  |          |   | D   | ec                                      |                  | lan            | reading F        | eb              |                  | lar  |
| Site          | Loc                | ation                        | Nam             | e of the F           | Persons in Ch   | narge    | Contents of Activity                            | Planning<br>Date  | Completed                               | Plenning<br>Date | Completed      | Plenning<br>Date | Completed       | Planning<br>Date | Completed  |
| No.           | Sub Division       | Site Name                    | XEN             | SDO                  | Sub Engineer  | Operator | Provides (ACC) and a second state of the second | No standarda  | ter költhang (                          | 1910-1910-1010   | 1.2.4. (Al. 1) | · in double      | 1.2.3.4.5.3.5.5 | a shrance        |  |
| -             | Derinet            | Towner .                     | Adal            | Robert               | Thorpore.   |          | 1. 5S Activity                                  | 25  | 25.                                     | 1000             |                |                  |                 |                  | 13377  |
| 1.            | Drowings<br>SouthI | Township.<br>Dronneg.<br>Nie | Adel<br>Shary   | Asting               |   |          | 2. Improve PPE/First Aid Kit                    |   |   | 10               | 12.            |                  |                 |                  |  |
|               |                    | The                          |                 |                      |   |          | 3. Job Safety Analysis                          |   | A. S.                                   | 11-              | 15             |                  |                 |                  |  |
| 1             |                    |                              |                 |                      |   |          | 1. 5S Activity                                  |   |   | 25.              | 30             |                  | i Karlar        |                  | and the second   |
| 2.            |                    |                              |                 |                      | And Antony Parts  |          | 2. Improve PPE/First Aid Kit                    |   |   |                  |                | 5                | 8               |                  |  |
|               |                    |                              |                 |                      | 1. CP 198   |          | 3. Job Safety Analysis                          | nia de la constante<br>Constante de la constante de la<br>Constante de la constante de la | and the<br>Table Color                  |                  |                | 8.               | 9               |                  | 1977 - A<br>1977 - A<br>1977 - A   |
| -             |                    |                              |                 | neeraan<br>Tageeraan |   |          | 1. 5S Activity                                  |   |   |                  |                | 9-               | 10              |                  | $(\frac{1}{2},1$ |
| з.            |                    |                              |                 |                      |   |          | 2. Improve PPE/First Aid Kit                    |   |   |                  |                |                  | 12              |                  | (New States)   |
|               |                    | and and a second             |                 | 5 14.<br>5 14.       |   |          | 3. Job Safety Analysis                          |   | $\langle \phi_{\rm sp} \rangle_{\rm f}$ |                  |                | 13               | 14.             |                  |  |
| in the second |                    |                              |                 |                      | n fra Bringen (†<br>1975) - Standerski († 1975)<br>1977 - Standerski († 1975) |          | 1. 5S Activity                                  | a anti-   |   |                  |                | 15               | 16              |                  |  |
| 4.            |                    |                              | and the         |                      | A States  |          | 2. Improve PPE/First Aid Kit                    | n shanna<br>Manin   |   |                  |                | 17.              | 18              |                  | 1.19   |
|               |                    | 1 Carl                       | 2612            |                      |   |          | 3. Job Safety Analysis                          | in the second   | 2233                                    | Parties and      |                | 19               | 20              | 1000             |  |

Annex 3.62 OJT Implementation Procedure for O&M of Mechanical Equipment in Fall 2016 - Fall 2017



OJT Implementation plan for Record Keeping, SOP & Preventive Maintenance Activity of Pump, Motor and Valves



Course: WSD 5231 modules 1, 4

|             |                     |  | Team and S                         | Site Inform   | ation                 |                  |               |                           |          |           |          |           |                  | 201       | 7        |           |          |           |          |          |
|-------------|---------------------|--|------------------------------------|---------------|-----------------------|------------------|---------------|---------------------------|----------|-----------|----------|-----------|------------------|-----------|----------|-----------|----------|-----------|----------|----------|
|             | T                   |  | i cam anu s                        | Site morm     | ation                 |                  |               | -                         | J        | an        | F        | eb        | Ma               | rch       | Ар       | ril       | Μ        | ay        | J        | une      |
| Sita        |                     | Site Iformation                          | 1                                  | Γ             | Detailed Tea          | um Informati     | on            | Parameters to check       | Planning |           | Planning |           | Planning         |           | Planning |           | Planning |           | Planning |          |
| Site<br>No. | Participant<br>Name | WASA/Division/Sub<br>Division            | Site Name                          | XEN           | SDO                   | Sub Engineer     | Operator      |                           | Date     | Completed | Date     | Completed | Planning<br>Date | Completed | Date     | Completed | Date     | Completed | Date     | Complete |
|             |                     |  |                                    |               |                       |                  |               | Daily operations record   |          |           |          |           |                  |           |          |           |          |           |          |          |
|             |                     |  |                                    |               |                       |                  |               | Facility inspection sheet | 15-Jan   |           |          |           |                  |           |          |           |          |           |          |          |
| 1.          | Amir Tufail         | Lahore/Allama Iqbal                      | LOS Tube well                      | Sohail Qadir  | Saif Ch.              | Amir Tufail      | Ashfaq        | Maintenance plan          | 15-5411  |           |          |           |                  |           |          |           |          |           |          |          |
|             | Anni Tulan          | Town/Ichra                               | LOS Tube wen                       | Cheema        | ban en.               | Anni Tulan       | Asinaq        | O&M Manuals for Equipment |          |           |          |           |                  |           |          |           |          |           |          |          |
|             |                     |  |                                    |               |                       |                  |               |                           |          |           |          |           |                  |           |          |           |          |           |          |          |
|             |                     |  |                                    |               |                       |                  |               |                           |          |           |          |           |                  |           |          |           |          |           |          |          |
|             |                     |  |                                    |               |                       |                  |               | Daily operations record   | 15th     |           |          |           |                  |           |          |           |          |           |          |          |
|             |                     |  |                                    |               |                       |                  |               | Facility inspection sheet | 25th     |           |          |           |                  |           |          |           |          |           |          |          |
| 2.          | Souman Khalid       | Lahore/Ravi                              | Out fall<br>Dewatering             | Saleem Ashraf | Souman Khalid         | Atif             | Adnan Javed   | Maintenance plan          |          |           | 5th      |           |                  |           |          |           |          |           |          |          |
|             |                     | Town/Main Outfall                        | workshop                           |               |                       |                  |               | O&M Manuals for Equipment |          |           | 15th     |           |                  |           |          |           |          |           |          |          |
|             |                     |  |                                    |               |                       |                  |               |                           |          |           |          |           |                  |           |          |           |          |           |          |          |
|             |                     |  |                                    |               |                       |                  |               |                           |          |           |          |           |                  |           |          |           |          |           |          |          |
|             |                     |  |                                    |               |                       |                  |               | Daily operations record   | -        |           |          |           |                  |           |          |           |          |           |          |          |
|             |                     |  |                                    |               |                       |                  |               | Facility inspection sheet | 16th     |           |          |           |                  |           |          |           |          |           |          |          |
| 3.          | Fayyaz              | Lahore/Drainage<br>south/Drainage South- | Tank # 3<br>Township               | Adeel Shareef | Hafiz Raheel<br>Asraf | Fayyaz Ahmed Ch. | Muhammad Arif | Maintenance plan          | -        |           |          |           |                  |           |          |           |          |           |          |          |
|             |                     | 1  | rownsnip                           |               | Astai                 |                  |               | O&M Manuals for Equipment |          |           |          |           |                  |           |          |           |          |           |          |          |
|             |                     |  |                                    |               |                       |                  |               |                           |          |           |          |           |                  |           |          |           |          |           |          |          |
|             |                     |  |                                    |               |                       |                  |               |                           |          |           |          |           |                  |           |          |           |          |           |          |          |
|             |                     |  |                                    |               |                       |                  |               | Daily operations record   | 4        | 30th      |          | 28th      | -                | 30th      |          |           |          |           |          |          |
|             |                     |  | Tank # 3                           |               |                       |                  |               | Facility inspection sheet | 1st      | 30th      | 1 st     | 28th      | 1st              | 30th      |          |           | -        |           |          |          |
| 4.          | Waqas Liaqat        | Lahore/Drainage<br>south/Drainage South- | Township<br>Komatsu                | Adeel Shareef | Waqas                 | Ghaffar          | Ilyas         | Maintenance plan          | -        | 15th      |          | 15th      | -                | 15th      |          |           |          |           |          |          |
|             |                     | 1  | Excuvator                          |               |                       |                  |               | O&M Manuals for equipment |          | 1st       |          | 1st       |                  | 1st       |          |           |          |           |          |          |
|             |                     |  |                                    |               |                       |                  |               |                           |          |           |          |           |                  |           |          |           |          |           |          |          |
|             |                     |  |                                    |               |                       |                  |               |                           |          |           |          |           |                  |           |          |           |          |           |          |          |
|             |                     |  |                                    |               |                       |                  |               | Daily operations record   |          |           |          |           |                  |           |          |           |          |           |          |          |
|             |                     |  |                                    |               |                       |                  |               | Facility inspection sheet | 15th     |           |          |           |                  |           |          |           |          |           |          |          |
| 5.          | Umair Ayub          | Multan/Sewerage<br>south/Hassan Parwana  | Sewerage (Hassan<br>Parwana South) | Irfan Ali     | Umair Ayub            | shakeel Ahmad    |               | Maintenance plan          |          |           |          |           |                  |           |          |           |          |           |          |          |
|             |                     |  |                                    |               |                       |                  |               | O&M Manuals for Equipment |          |           |          |           |                  |           |          |           |          |           | _        |          |
|             |                     |  |                                    |               |                       |                  |               |                           |          |           |          |           |                  |           |          |           |          |           |          |          |
|             |                     |  |                                    |               |                       |                  |               |                           |          |           |          |           |                  |           |          |           |          |           |          |          |



OJT Implementation plan for Record Keeping, SOP & Preventive Maintenance Activity of Pump, Motor and Valves



Course: WSD 5231 modules 1, 4

| Ĩ |            |                     |   | Team and         | Sita Inform | ation        |                 |             |                           |                  |           |                  |           |                  | 201       | 7                |           |                  |           |                  |           |
|---|------------|---------------------|---|------------------|-------------|--------------|-----------------|-------------|---------------------------|------------------|-----------|------------------|-----------|------------------|-----------|------------------|-----------|------------------|-----------|------------------|-----------|
|   |            |                     |   | i cam anu s      | site inform |              |                 |             | -                         | J                | an        | F                | eb        | Ma               | rch       | Ар               | ril       | Μ                | ay        | Jı               | une       |
|   |            |                     | Site Iformation                         | n                | ]           | Detailed Tea | um Informatio   | on          | Parameters to check       | Planning         |           |
|   | ite<br>io. | Participant<br>Name | WASA/Division/Sub<br>Division           | Site Name        | XEN         | SDO          | Sub Engineer    | Operator    |                           | Planning<br>Date | Completed |
|   |            |                     |   |                  |             |              |                 |             | Daily operations record   | 1st to           |           |                  |           |                  |           |                  |           |                  |           |                  |           |
|   |            |                     |   |                  |             |              |                 |             | Facility inspection sheet | 15th             |           |                  |           |                  |           |                  |           |                  |           |                  |           |
|   |            | hakeel Ahmad        | Multan/Sewerage<br>south/Hassan Parwana | Sewerage (Hassan | Irfan Ali   | Irfan Ali    | shakeel Ahmad   | Ismaeel     | Maintenance plan          |                  |           |                  |           |                  |           |                  |           |                  |           |                  |           |
|   |            | nakeer Animau       | south/Hassan Parwana                    | Parwana South)   | inian An    | inan An      | Shakeel Allinau | Isinacei    | O&M Manuals for Equipment |                  |           |                  |           |                  |           |                  |           |                  |           |                  |           |
|   |            |                     |   |                  |             |              |                 |             |                           |                  |           |                  |           |                  |           |                  |           |                  |           |                  |           |
|   |            |                     |   |                  |             |              |                 |             |                           |                  |           |                  |           |                  |           |                  |           |                  |           |                  |           |
|   |            |                     |   |                  |             |              |                 |             |                           |                  |           |                  |           |                  |           |                  |           |                  |           |                  |           |
|   |            |                     |   |                  |             |              |                 |             |                           |                  |           |                  |           |                  |           |                  |           |                  |           |                  |           |
|   |            |                     |   |                  |             |              |                 | WASA Lahore |                           |                  |           |                  |           |                  |           |                  |           |                  |           |                  |           |
|   |            |                     |   |                  |             |              |                 |             |                           |                  |           |                  |           |                  |           |                  |           |                  |           |                  |           |
|   |            |                     |   |                  |             |              |                 |             |                           |                  |           |                  |           |                  |           |                  |           |                  |           |                  |           |
|   |            |                     |   |                  |             |              |                 | WASA Multan |                           |                  |           |                  |           |                  |           |                  |           |                  |           |                  |           |
|   |            |                     |   |                  |             |              |                 |             |                           |                  |           |                  |           |                  |           |                  |           |                  |           |                  |           |
|   |            |                     |   |                  |             |              |                 |             |                           |                  |           |                  |           |                  |           |                  |           |                  |           |                  | <u> </u>  |
|   |            |                     |   |                  |             |              |                 |             |                           |                  |           |                  |           |                  |           |                  |           |                  |           |                  |           |
|   |            |                     |   |                  |             |              |                 |             |                           |                  |           |                  |           |                  |           |                  |           |                  |           |                  |           |
|   |            |                     |   |                  |             |              |                 |             |                           |                  |           |                  |           |                  |           |                  |           |                  |           |                  |           |
|   |            |                     |   |                  |             |              |                 |             |                           |                  |           |                  |           |                  |           |                  |           |                  |           |                  |           |
|   |            |                     |   |                  |             |              |                 |             |                           |                  |           |                  |           |                  |           |                  |           |                  |           |                  |           |
|   |            |                     |   |                  |             |              |                 |             |                           |                  |           |                  |           |                  |           |                  |           |                  |           |                  |           |
|   |            |                     |   |                  |             |              |                 |             |                           |                  |           |                  |           |                  |           |                  |           |                  |           |                  |           |
|   |            |                     |   |                  |             |              |                 |             |                           |                  |           |                  |           |                  |           |                  |           |                  |           |                  |           |
|   |            |                     |   |                  |             |              |                 |             |                           |                  |           |                  |           |                  |           |                  |           |                  |           |                  |           |
|   |            |                     |   |                  |             |              |                 |             |                           |                  |           |                  |           |                  |           |                  |           |                  |           |                  |           |
|   |            |                     |   |                  |             |              |                 |             |                           |                  |           |                  |           |                  |           |                  |           |                  |           |                  |           |

Annex 3.63 OJT Implementation Procedure for Asset Management in Fall 2016

#### 04-Sohail Cheema & 06-Abdul Rehman

|                       |                  | Current   | Future Requirement                            | Remarks  |
|-----------------------|------------------|---|---|--|
|                       | what to do       | Monitoring the existing assets: daily, weekly, monthly, quarterly |   |  |
|                       | in charge        | O & M department (Division Level)                                 |   |  |
| Task 1:<br>Monitoring | Number of staffs | 04 Number<br>(01 Person each Sub division)                        | 08 Number<br>(02 Person each Sub<br>division) | (02 Person for field work in each sub division). |
|                       | Training         | NIL   | Quarterly Basis                               | Capacity Building.                               |
|                       | Budget           | 52,000/- (PKR)  | 220,000/- (PKR)                               |  |
|                       | Computers        | NIL   | NIL   |  |
|                       | Others           | -   | 08 Numbers<br>(Android Phones)                | 01 Number for each monitoring Official.          |
| Task 2:<br>Recording  | what to do       | Keeping records of the monitoring results                         |   |  |
|                       | in charge        | O & M department (Division Level)                                 |   |  |



Module 4: Asset Replacement Plan

| 1 1 |          |                               |                        |                     |
|-----|----------|-------------------------------|------------------------|---------------------|
|     | umber of | 04 Number                     | 08 (02 Person each Sub | 02 Persons each sub |
|     | affs     | (01 Person each Sub division) | division)              | division.           |

|                       | Training         | -  | Quarterly Basis | Capacity Building.  |
|-----------------------|------------------|--|-----------------|---|
| Task 2:<br>Recording  | Budget           | 72,000/- (PKR)   | 244,000/- (PKR) |   |
|                       | Computers        | 04 Number  | 09 Number       | 01 Number for each data<br>entry operator, 01 Number<br>for each SDO, and 01<br>Number for XEN. |
|                       | Others           | -  | -               |   |
| Task 3:               | what to do       | Updating GIS/ Asset database with the monitoring results |                 |   |
| Updating<br>GIS/Asset | in charge        | Director P&E   |                 |   |
| Database              | Number of staffs | 03 Numbers   | 09 Numbers      | 03 Numbers in Head<br>Office, 01 Number in each<br>town.  |
|                       | Training         | -  | Quarterly Basis |   |
|                       | Budget           | 150,000/-  | 450,000/-       |   |



Module 4: Asset Replacement Plan

|  | Computers | 03 Numbers | 09 Numbers |  |
|--|-----------|------------|------------|--|
|  | Others    | -          | -          |  |



|                      | what to do       | New asset register/ database updating |                 |  |
|----------------------|------------------|---------------------------------------|-----------------|--|
|                      | in charge        | Sub Division Officer                  |                 |  |
| Task 4:<br>New asset | Number of staffs | 04 Number                             | 08 Number       | 02 Person each Sub<br>Division   |
| register             | Training         | NIL                                   | Quarterly basis | How to evaluate<br>conditions of assets, how to<br>maintain the asset<br>record/history. |
|                      | Budget           | 100,000/- (PKR)                       | 400,000/- (PKR) |  |
|                      | Computers        | NIL                                   | 04 Number       | 01 Number in each sub<br>division.   |
|                      | Others           | -                                     | -               |  |



## Sohail Sindhu & Waqas

|                       |                     | Current   | Future Requirement                                       | Remarks  |
|-----------------------|---------------------|---|--|--|
|                       | what to do          | Monitoring the existing assets: daily, weekly, monthly, quarterly |  |  |
|                       | in charge           | O & M department  |  |  |
| Task 1:<br>Monitoring | Number of<br>staffs | 03  | 03   | <ol> <li>1 no. Installations<br/>montoring</li> <li>2 no water supply<br/>system montoring.</li> <li>3 no sewerage<br/>system monitoring.</li> </ol> |
|                       | Training            | no  | yes  |  |
|                       | Budget(PKR)         | No particular budget for asset monitoring                         | 5 lacs for 1 <sup>st</sup> year<br>1.6lac yearly onwards | 3 bikes and 3 mobiles.<br>3 bikes with fuel 60<br>lit/bike/month.  |
|                       | Computers           | no  | no   |  |
|                       | Others              | No other facility   | Need bikes with fueling.<br>Android Mobile phones.       |  |
| Task 2:               | what to do          | Keeping records of the monitoring results                         |  |  |





Module 4: Asset Replacement Plan

| Recording | in charge | O & M department    |   |   |
|-----------|-----------|---------------------|---|---|
|           |           | Number of<br>staffs | 2 | 3 |

|                       | Training         | no   | Need training     |                               |
|-----------------------|------------------|--|-------------------|-------------------------------|
| Task 2:<br>Recording  | Budget           | exists   | Needs upgradation |                               |
|                       | Computers        | 1  | 1                 |                               |
|                       | Others           | nil  | nil               |                               |
| Task 3:               | what to do       | Updating GIS/ Asset database with the monitoring results |                   |                               |
| Updating<br>GIS/Asset | in charge        | sdo  | sdo               |                               |
| Database              | Number of staffs | 0  | 1                 | GIS Trained staff is required |
|                       | Training         | nil  | Required          |                               |
|                       | Budget           | nil  | 3.5 lacs/annum    |                               |



Module 4: Asset Replacement Plan

| Computers | 0   | 1              |  |
|-----------|-----|----------------|--|
| Others    | nil | GIS equipment. |  |



|                       | what to do       | New asset register/ database updating                  |            |  |
|-----------------------|------------------|--|------------|--|
| Task 4:               | in charge        | GIS / Asset database sections and procurement sections |            |  |
| New asset<br>register | Number of staffs | 1 sub engr   | 1 sub engr |  |
|                       | Training         | nil  | Required   |  |
|                       | Budget           | exist  | 50,000/-   |  |
|                       | Computers        | 0  | 1          |  |
|                       | Others           | nil  | nil        |  |



#### 15-Ms Burrira & 16-Ms Zoya WASA Faisalabad

|                       |                     | Current   | Future Requirement   | Remarks |
|-----------------------|---------------------|---|--|---------|
|                       | what to do          | Monitoring the existing assets: daily,<br>weekly, monthly, quarterly  | There must be written<br>schedule and constant check<br>on these proceedings |         |
|                       | in charge           | WWM department (SDOs)   |  |         |
| Task 1:<br>Monitoring | Number of<br>staffs | <u>Disposals:</u><br>SE=3, Electrician=4, Mechanic=4<br><u>Vehicle/Machinery:</u><br>SE=1, Supervisor=1, Mechanic=1 | Number of staff is sufficient  |         |
|                       | Training            | Nil   | Technical trainings should be given in specific fields                       |         |
|                       | Budget              | No specific budget for monitoring,<br>managed using O&M budget  | Specific head should be there for monitoring                                 |         |
|                       | Computers           | Nil   | Min=3  |         |
|                       | Others              | Level sensors, vehicle tracking system  | Sufficient   |         |
| Task 2:               | what to do          | Keeping records of the monitoring results   |  |         |



Module 4: Asset Replacement Plan

| Recording | in charge           | WWM department (SDOs)                    |                 |  |
|-----------|---------------------|--|-----------------|--|
|           | Number of<br>staffs | Computer Operator=3<br>Data collection=4 | Operators=4 min |  |

|                       | Training         | No formal training. AD(s) guide staff as per requirement     | MS office training should<br>be compulsory  |
|-----------------------|------------------|--|---|
| Task 2:<br>Recording  | Budget           | No specific budget. O&M budget is used for recording results | Specific head should be<br>there for recording  |
|                       | Computers        | 3  | 4 min   |
|                       | Others           | -  | -   |
| Task 3:               | what to do       | Updating GIS/ Asset database with the monitoring results     |   |
| Updating<br>GIS/Asset | in charge        | GIS Analyst(s)   | 3 GIS Analyst (minimum)<br>must be there  |
| Database              | Number of staffs | AD=2<br>Work charge/Surveyors=10                             | For surveys and ground<br>truthing minimum 10 people<br>are required in each project                                |
|                       | Training         | No formal training executed                                  | Formal trainings and<br>workshops specially for<br>lower staff must be<br>arranged specially to handle<br>equipment |



Module 4: Asset Replacement Plan

| Budget    | Budget is not allocated specifically for<br>GIS section; GIS work is completed in<br>respective project individually | -   |  |
|-----------|--|---|--|
| Computers | 2  | Central repository/server<br>required<br>Arcpad/GPS devices<br>Android Phones |  |
| Others    | -  | -   |  |



|                                  | what to do       | New asset register/ database updating                            |  |
|----------------------------------|------------------|--|--|
|                                  | in charge        | GIS / Asset database sections and procurement sections           |  |
| Task 4:<br>New asset<br>register | Number of staffs | 0 for DB records<br>Manual recording=1 SE in each<br>subdivision | Present staff must take<br>responsibility of DB updates<br>regarding Assets. other<br>department's cooperation<br>would be required for that<br>task to complete<br>systematically |
|                                  | Training         | 1  | some formal trainings and<br>workshops required<br>specifically on Faisalabad's<br>system and data type  |
|                                  | Budget           | Nil  | A specific amount of budget<br>solely dedicated for making<br>and timely updates of assets<br>must be considered   |
|                                  | Computers        | 0  | Min 3 with central server  |
|                                  | Others           |  |  |



4

## Muhammad Tauseef

## **Assistant Director Engineering**

## WASA (GDA)

# Gujranwala

|            |                     | Current   | Future Requirement  | Remarks                                |
|------------|---------------------|---|---|--|
|            | what to do          | Monitoring the existing assets: daily, weekly, monthly, quarterly             |   |  |
| Task 1:    | in charge           | Assistant Director Engineering  | Assistant Director<br>Engineering   | Regular Visits                         |
| Monitoring | Number of<br>staffs | 1(One sub engineer for each<br>subdivision)<br>3(One team for 2 subdivisions) | 2(Two sub engineers for<br>each subdivision)<br>3(One team for each<br>subdivision) | Monitoring will be more efficient      |
|            | Training            | No Training   | Trainings for each level of staff   | Technical skills will<br>improve       |
|            | Budget              | No Budget Allocation  | Allocation of Budget for<br>procurement of Monitoring<br>Equipment's                | Quality of Monitoring will be Accurate |
|            | Computers           | No Computers  | 3 Computers for each subdivision  | ADE can analyze instantly              |



Module 4: Asset Replacement Plan

|           | Others              | No Vehicles  | Vehicles for each level staff    | Response time of staff will improve |
|-----------|---------------------|--|----------------------------------|-------------------------------------|
| Task 2:   | what to do          | Keeping records of the monitoring results  |                                  |                                     |
| Recording | in charge           | Sub Engineer   | Sub Engineer                     | Regular Visits                      |
|           | Number of<br>staffs | 3(One team for 2 subdivisions)<br>(Electrician, mechanical supervisor & a<br>helper) | 3(One team for each subdivision) | Monitoring will be more efficient   |

|                       | Training         | No Training  | Trainings for each level of staff                                   | Technical skills will improve                      |
|-----------------------|------------------|--|---|--|
| Task 2:<br>Recording  | Budget           | No Budget Allocation                                     | Allocation of Budget for<br>procurement of Recording<br>Equipment's | Quality of Recording will be Accurate              |
|                       | Computers        | No Computers   | 3 Computers for each subdivision                                    | ADE can analyze<br>Recording practice<br>instantly |
|                       | Others           | No Vehicles  | Vehicles for each level staff                                       | Response time of staff will improve                |
| Task 3:<br>Updating   | what to do       | Updating GIS/ Asset database with the monitoring results |   |  |
| GIS/Asset<br>Database | in charge        | No One   | GIS Expert is required  | Overall Monitoring of<br>Updating                  |
|                       | Number of staffs | No staff   | 2 Assistants for GIS Expert   | Record will be updated on AIMS                     |





| Training  | No Training          | Trainings for both level of staff                                    | Technical skills will<br>improve              |
|-----------|----------------------|--|---|
| Budget    | No Budget Allocation | Allocation of Budget for<br>Establishment of GIS / Asset<br>database | Assets will be evaluated<br>and located       |
| Computers | No Computers         | 3 Computers for each subdivision                                     | Asset database will be saved in Computers     |
| Others    | No Phones            | Android Phones should be given to staff                              | Very necessary for Asset<br>database in field |



|                       | what to do       | New asset register/ database updating |                                   |                                   |
|-----------------------|------------------|---------------------------------------|-----------------------------------|-----------------------------------|
| Task 4:               | in charge        | Assistant Director Engineering        | Assistant Director<br>Engineering |                                   |
| New asset<br>register | Number of staffs | 1(One sub engineer)                   | 1 store keeper<br>2 helpers       | Asset Register will be<br>updated |
|                       | Training         | No Training                           | Trainings for both level of staff | Technical skills will<br>improve  |
|                       | Budget           | No Budget Allocation                  | Allocation of budget              |                                   |
|                       | Computers        | No Computers                          | 1 Computer                        | Balance Assets                    |
|                       | Others           | No vehicles                           | 2 vehicles                        | To provide in field               |



Module 4: Asset Replacement Plan

## Waqas & Sajid WASA Multan

|                       |                  | Current   | Future Requirement   | Remarks   |
|-----------------------|------------------|---|--|---|
|                       | what to do       | Monitoring the existing assets: daily, weekly, monthly, quarterly | Categorization of assets on<br>monitoring period basis and<br>device specific SOPs. Deployment<br>of skilled person for monitoring | At each sub-division<br>level   |
|                       | in charge        | Concerned Sub-divisions   | Concerned Sub-divisional staff   | Capacity development<br>of the sub divisions is<br>necessary.                   |
| Task 1:<br>Monitoring | Number of staffs | Operators and supervisors   | Mechanic, electrician supervisors at each sub-division level   |   |
|                       | Training         | Nil   | Concerned sub-divisional staff<br>must be trained and fully<br>equipped in their own capacity.                                     | Specific training how<br>to monitor and judge<br>the condition of the<br>assets |
|                       | Budget           | Nil   | A specific budget must be allocated.   |   |
|                       | Computers        | Nil   | 1x Laptop and 1x computer must<br>be provided at each sub-division   | If computerized<br>SCADA system is<br>installed                                 |
|                       | Others           | Nil   | Vehicles & digital cameras,<br>android mobile phones   | For communication<br>& monitoring   |
| Task 2:               | what to do       | Keeping records of the monitoring results                         | Record must be computerized at each sub-division level   |   |



Module 4: Asset Replacement Plan

| Recording | in charge           | Concerned Sub-divisions | Concerned Sub-divisions         | SDO, S/E & skilled persons.                |
|-----------|---------------------|-------------------------|---------------------------------|--|
|           | Number of<br>staffs | Nil                     | Computer & data entry operators | 1 each to prepare and update the database. |

| Task 2:               | Training         | Nil  | Concerned sub-divisional<br>staff must be trained and<br>fully equipped in their own<br>capacity. | Asset recording &<br>updating Training            |
|-----------------------|------------------|--|---|---|
| Recording             | Budget           | Nil  | Specific budget   |   |
|                       | Computers        | Nil  | 1x Laptop and 1x computer<br>must be provided at each<br>sub-division                             | For recording, updating and keeping the data base |
|                       | Others           | Nil  | Printers, scanners  |   |
| Task 3:               | what to do       | Updating GIS/ Asset database with the monitoring results | Yes   |   |
| Updating              | in charge        | Nil  | A Separate GIS Cell   | P & D Directorate                                 |
| GIS/Asset<br>Database | Number of staffs | Nil  | 2 x GIS analysts, 1 x<br>Assistant Director<br>Engineering and assistant<br>staff.                | GIS Posts must be created.                        |
|                       | Training         | Nil  | How how to input and<br>update data into assets<br>database.                                      | In Aljazari Academy<br>Lahor.                     |
|                       | Budget           | Nil  | Specific Budget   |   |



| Computers | Nil | 3 x Laptops and 3 x<br>Computers |  |
|-----------|-----|----------------------------------|--|
| Others    | Nil | Nil                              |  |

|                      | what to do       | New asset register/ database updating | Yes   | Especially an asset with<br>worth 1 million and<br>service life more than 1<br>year should be register<br>immediately. |
|----------------------|------------------|---------------------------------------|---|--|
| Task 4:<br>New asset | in charge        | Nil                                   | Register a new assert in<br>separate GIS Cell/ Asset<br>database section                          | Assistant Director   |
| register             | Number of staffs | Nil                                   | 2 x GIS analysts, 1 x<br>Assistant Director<br>Engineering and assistant<br>staff.                | Total 5 No. of staff<br>(including assistants)   |
|                      | Training         | Nil                                   | How to evaluate conditions<br>of assets, how to input and<br>update data into assets<br>database. | How to update new asset<br>register/ database  |
|                      | Budget           | Nil                                   | Specific budget   |  |
|                      | Computers        | Nil                                   | 3 x Laptops and 3 x<br>Computers  |  |
|                      | Others           | Nil                                   |   |  |

1. Hafiz Muhammad Waqas

2. Muhammad Sajid

(WASA Multan)



Module 4: Asset Replacement Plan

## 11&12 Asim & WASA Rawalpindi

|            |                     | Current  | Future Requirement   | Remarks   |
|------------|---------------------|--|--|---|
|            | what to do          | There is no proper monitoring system is<br>working in R WASA. However, some<br>assets are being monitored on daily or<br>whenever visited by the in charge or any<br>higher authority. | It is proposed that there<br>must be a separate Assets<br>Management Directorate,<br>which have sufficient staff<br>tools and budget for<br>monitoring, recording of<br>assets on GIS basis. | Will ensure the assets<br>recording and updating<br>GIS data base |
| Task 1:    | in charge           | Two, supervisors or higher officer   | Director Assets<br>Management  |   |
| Monitoring | Number of<br>staffs | No proper staff is being engaged for monitoring purpose.   | Director, Deputy Director,<br>2 Assistant Director, 4 sub<br>engineer with office and<br>field staff. (20 no)  | From existing staff   |
|            | Training            | nil  | All staff must be trained at their own levels  |   |
|            | Budget              | No specific budget is allocated. The<br>O&M budget is used   | 5 millions / annum   |   |
|            | Computers           | nil  | 4 laptop and 2 no's desk top   |   |
|            | Others              | nil  | Transport (4 small vehicles<br>and 6 no's motor bikes  |   |



Module 4: Asset Replacement Plan

| Task 2:   | what to do          | Yes there is a property register, stock register are using for this purpose | There should be a proper<br>recording and updating<br>system using GIS data base |
|-----------|---------------------|---|--|
| Recording | in charge           | Accounts department and store in charge                                     | Director assets<br>management  |
|           | Number of<br>staffs | 4 no's  | 1 assistant director with 2<br>sub engineers and GIS<br>specialist               |

|                       | Training         | nil           | Must be trained at their<br>own level                                 | Capacity building          |
|-----------------------|------------------|---------------|---|----------------------------|
| Task 2:<br>Recording  | Budget           | nil           | As above  |                            |
|                       | Computers        | nil           | 1 no lap top and 1 desk top   |                            |
|                       | Others           | nil           | 1 small vehicle and 2 motor bike                                      |                            |
| Task 3:<br>Updating   | what to do       | No GIS system | There must be GIS based assets data base system                       |                            |
| GIS/Asset<br>Database | in charge        | nil           | Director Assets<br>management   |                            |
|                       | Number of staffs | nil           | 1 GIS specialist with1 assistant                                      | May be engaged from market |
|                       | Training         | nil           | Must be trained with up to<br>date knowledge and latest<br>technology |                            |





| Budget    | nil | 1.5 million  |  |
|-----------|-----|--------------|--|
| Computers | Nil | 1 lap top    |  |
| Others    | nil | 1 motor bike |  |



|                       | what to do       | No asset register is maintaining | There must be assets register maintained |                     |
|-----------------------|------------------|----------------------------------|--|---------------------|
| Task 4:               | in charge        | nil                              | Director assets<br>management            |                     |
| New asset<br>register | Number of staffs | nil                              | 1 accountant with 1 assistant            | From existing staff |
| 8                     | Training         | nil                              | Must be trained                          | Capacity building   |
|                       | Budget           | nil                              | 0.1 million                              |                     |
|                       | Computers        | nil                              | 1 desk top                               |                     |
|                       | Others           | nil                              | nil                                      |                     |



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|                       |                  | Current   | Future Requirement  | Remarks                                       |
|-----------------------|------------------|---|---|---|
|                       | what to do       | Monitoring the existing assets: daily, weekly, monthly, quarterly                         |   |   |
| Task 1:<br>Monitoring | in charge        | O & M department (Assistant Director)   | Assistant Director(AM)  | Regular visit and log signed at station       |
|                       | Number of staffs | Junior Engineer's at their sector with<br>their foreman's (3) as per assets<br>requirment | SAME AS CURRENT<br>Urgent Replacement<br>required of retired person |   |
|                       | Training         | No training   | Quarterly training program  |   |
|                       | Budget           | Not define  | Should be prepare with the help of AM                               |   |
|                       | Computers        | 3 computers have in region  | Laptop required for AM  |   |
|                       | Others           | No vehicles   | Vehicles Required for AM and junior Engineers                       | 800 cc for AM & Bikes for<br>Junior Engineers |
| Task 2:<br>Recording  | what to do       | Keeping records of the monitoring results   |   |   |
|                       | in charge        | O & M department (Junior Engineers)   | Junior Engineers  |   |





Module 4: Asset Replacement Plan

|  | Number of<br>staffs | 03 (JEs) | 03 |  |
|--|---------------------|----------|----|--|
|--|---------------------|----------|----|--|

| Task 2:<br>Recording                         | Training         | No training  | Quarterly Training<br>Required for Fresh their<br>brains                |
|--|------------------|--|---|
|  | Budget           | No define  | Should be prepared with<br>the help of AM                               |
|  | Computers        | No Computer  | 01 system Required for<br>recording                                     |
|  | Others           |  | Vehicles required   |
| Task 3:<br>Updating<br>GIS/Asset<br>Database | what to do       | Updating GIS/ Asset database with the monitoring results |   |
|  | in charge        | No Any   | Separate Engineer required<br>for record the all<br>GIS ,Assets coding, |
|  | Number of staffs | No any   | 1 Engineer only   |
|  | Training         | No any   | Quarterly   |
|  | Budget           | No any   | Arrange for Engineer  |
|  | Computers        | No   | Laptop or system  |





Module 4: Asset Replacement Plan

| Others |  |  |
|--------|--|--|
|        |  |  |



|                                  | what to do       | New asset register/ database updating   |  |
|----------------------------------|------------------|---|--|
|                                  | in charge        | GIS / Asset database sections and<br>procurement sections<br>(GM capital works) | Engineer   |
| Task 4:<br>New asset<br>register | Number of staffs | 01  | 1 Engineer required<br>for Operation and<br>Services<br>2 which already<br>mentioned in Task 3 |
|                                  | Training         | No  | Quarterly required   |
|                                  | Budget           | No  | For Engineer facilitation  |
|                                  | Computers        | 1 system  | Laptop or system for O&S   |
|                                  | Others           | No  | At least bike for visiting the<br>sites for recording of New<br>Assets                         |

Muhammad Ali

NSUSC



Module 4: Asset Replacement Plan

Annex 3.64 Action Plan for O&M of Tube Well and Pump Facility in Spring 2017

# O&M Action Plan of Water Supply

# Participant Name: M Tahir Rehman Designation: Sub Engineer (WASA Lahore)

| Sr.<br>No | Issue  | Cause                                       | Mitigation Measure                                    |
|-----------|--|---|---|
| 1         | Leakage of Water Supply Lines                        | Contamination<br>of clean<br>drinking water | Repair of Lines                                       |
| 2         | Low Pressure of water supply<br>network              |   | New reservoir / new t/w is<br>operation               |
| 3         | Connected Water Supply Lines to<br>sewer line        | Contamination<br>of clean drink             | New Water Supply line<br>opposite site                |
| 4         | Leaking of poor valve, jointing<br>material          | Poor water<br>drinking                      | Replacent of good quality of<br>valve jointing materi |
| 5         | Contamination of source point/<br>distribution lines |   | Chlorination  |
| 6         | Laying of old cast iron pipe lines                   | Cause of contamination                      | New water supply line for<br>good product             |

# Participant Nam: Lal Tab Designation: Tube Well Incharge (WSSC Mardan)

- 1. Separation of sewerage line to water supply line
- 2. No chlorination

Participant Nam: Aamir Hussain Shah Designation: Sub Engineer RWP WASA

| Sr.<br>No | Issue                    | Cause             | Mitigation Measure                   |
|-----------|--------------------------|-------------------|--------------------------------------|
| 1         | Shortage of water        | Ground water      | New Tube well                        |
|           |                          | depletion problem | Surface Water                        |
| 2         | Low Pressure             | Shortage of water | Repair of OHR                        |
| 3         | Biological Contamination |                   |                                      |
| 4         | Leakage                  | Old rusty         | Repair of pipe/ Change the pipe line |

Participant Name: Shafiq ur Rehman Designation: Field Supervisor (WSSC Kohat)

| Sr.<br>No | Issue        | Cause | Mitigation Measure |
|-----------|--------------|-------|--------------------|
| 1         | Paip lieking |       |                    |
| 2         | Olds paip    |       |                    |

| Participant Name: | Waqar Anjum                |
|-------------------|----------------------------|
| Designation:      | Pipe Fitter WSSC Kohat KDA |

Left blank chart

| Participant Name: | Asim Nazir                   |
|-------------------|------------------------------|
| Designation:      | Deputy Director M&E WASA/RWP |

| Sr. | Issue             | Cause                | Mitigation       |
|-----|-------------------|----------------------|------------------|
| No  |                   |                      | Measure          |
| 1   | Shortage of water | Ground water         | New tube well    |
|     |                   | depletion population | surface water    |
| 2   | Low Pressure      | Shortage of water/   | Provision of OHR |
|     |                   | OHR                  | New Machinery    |

| 3  | Biological Contamination      | Mixing of water with sewage / leakage   | Chlorination                    |
|----|-------------------------------|---|---------------------------------|
| 4  | Contamination in distribution | Old rusting network<br>and mixing issue | F/plants                        |
| 5  | Leakages                      | Old network/<br>incidents               | Repair/ replacement<br>of lines |
| 6  | Wastage of water              | Lack of awareness                       | Public awareness                |
| 7  | Political / Social Influence  | Political system                        | Better management               |
| 8  | Line Breakage                 | Old line                                | Replacement of old<br>line      |
| 9  | Ground treatment              | Surface water contaminated              | Treatment plant                 |
| 10 | Electricity Failure           | Load Shedding                           | Generators                      |

Annex 3.65 Action Plan for Leakage Detection in Spring 2017

# Leakage Prevention Plan

# WASA Multan

### M. Waqas (Assistant Director) Amir Hussain Bukhari (Sub-Engineer)

- Leakage detection team at WASA Multan consists of 2 plumbers, 4 linemen and they are reported to Sub- Engineer who is reporting to SDO.
- Water distribution maps and drawings must be available at sub-division level for efficient working of leak detection team.
- Latest Leak detection equipment must be provided.
- Leak Detection team will visit the area on daily basis and provide the gathered information for record maintaining and necessary action.
- Pressure gauges and flow meters should be installed at each tube well as well as each distribution.
- Analysis will be performed on pipe design life, quality of pipe on quarterly basis for better planning future.
- By establishing the leak detection teams, leakage losses could be reduced up to 5-10 % during the current year.
- Patrolling survey method is usually feasible for data collection of leakage.
- The SDO and Sub-Engineer will quickly move their repair team to repair the observed leakages.
- After field counter measures, analysis will be done under the supervision of SDO and Sub-Engineer to determine the causes of leakage.
- Following the mentioned action plan, N.R. W's would be reviewed so that comparison could be done.
- Thus a system could be established for smooth operation and maintenance of water supply network.

# WASA Gujranwala

### Ali Qumain (RA) Urban Unit

#### Preparation

- 1. Formation of Leak Detection Team.
- 2. Select one zone and conduct this plan on one zone.
- 3. Prepare GIS maps which shows the condition of pipelines of each zone.
- 4. Calculate the discharges at regular intervals in selected area.
- 5. Select the exact leakage points in survey.
- 6. Repair the leakages with most feasible practices available.

#### Equipment

- 1. Pressure Recorder
- 2. Acoustic Leak Detector
- 3. Metal Pipe Locator
- 4. Non Metal Pipe Locator
- 5. Ultrasonic Flow Meter

#### Plan

- 1. Current NRW is 50 % and the target is to reduce it each year by 10 %
- 2. Repeat the similar plan in all the zones.

#### **Evaluations**

- 1. Conduct the surveys at regular intervals to evaluate the results.
- 2. Compare the current results with the past result so that improvement can be made in plan.

# WASA Rawalpindi

# Samran Zahid (Sub Engineer) Noushad Aslam (Sub Engineer)

## • Preparation

- 1. We already have leakage detection cell which consists of 1 supervisor, 1 pipe fitter and 2 helpers.
- 2. We already have GIS maps.
- 3. Leak Detection equipment are needed for better results.

## • Basic Survey

- 1. We will analyze the water supply pressure and flow by using the equipment.
- 2. We already have separate maps of each area and pipe lines.

### • Plan

- 1. NRW is 40% and the target is to reduce every year by 10 %.
- 2. We will choose survey method according to the area.

## • Action/Implementation

1. We will repair the pipelines immediately and also calculate the volume of leakages.

# Water and Sanitation Services Peshawar

#### Engr. Amir Khattak

### • Preparation

- 1. Establishment of Leakage detection cell and team which already consists of plumbers, pipe fitters and helpers.
- 2. Preparation of water distribution network maps and drawings which is under preparation.
- 3. Procurement of leak detection equipment which depends upon the availability of funds.

## Basic Survey

- 1. Analysis of water supply (pressure and flow measurements), which has yet to be planned.
- 2. Divide the city into the Blocks, city is divided in 4 blocks which is further divided into small units.
- 3. Study and analysis of pipe's design life and material quality.

## • Action Implementation

- 1. Counter measures for leakage are under process which would be more effective if the equipment are available.
- 2. Leakage detection cell will organize the survey for leak detection which would focus particularly on conditions of pipe, workmanship and causes of leakage.
- 3. Leakage volume will be calculated provided that the equipment is available.
- 4. For surface leakages quick repairs are being done but for underground leakages more funds and equipment is needed.

### • Evaluation

- 1. Analysis of the results will be done by calculation of discharges at various locations, also the metering system will be upgraded.
- 2. Plan vs Action will be reviewed keeping in view the reduction in NRW %.

# Water and Sanitation Services Mardan

#### Muhammad Khalil Akbar Manager Municipal Services

- We will establish the leakage detection cell which will be consists of Assistant Manager (Water Supply), pipe line supervisor and plumbers.
- We will develop GIS maps of distribution network.
- We will procure Acoustic Leak Detector, Metal Pipe Locator and non-metal pipe locator.
- We will analyze one tube well network for 3 days and collect the previous data about pipe laying (year, type etc.)
- We will conduct walk through survey throughout the length of distribution pipe.
- Leakage will be find out by using Acoustic Leak Detector.
- As most of the pipes in Mardan are GI so we will analyze the causes of leakage and also prepare the GIS maps of pipe network.
- We have 22 tube wells in Mardan, so the survey will take 66 days.

# **Evaluation**

- The analysis of leak prevention plan will enable us to decide whether the pipe needs repair or it should be replaced with a better quality.
- Our action plan will help us to improve the quality of water by reducing the contaminations.

# Water and Sanitation Services Kohat

# Azmat Ali

#### Ibrar Ali

## • Formation of Teams

- 1. There are 30000 number of connections and 150 tube wells.
- 2. Total pipe Length is 10000 meters.
- 3. Blocks = 6, Helpers = 12, Pipe Fitters = 6, Supervisors = 6, Engineers = 2 and Manager = 1
- 4. There is one leak detection team and 6 sub teams.
- 5. Preparation of drawings and maps will be done.

## • Basic Survey

- 1. Use of pressure recorders and flow meters to determine the flow and losses in network.
- 2. Use of the leakage detectors to pinpoint the leaks.

## • Plan

- 1. Number of leakages to repair
- 2. Pipe length to be replaced.

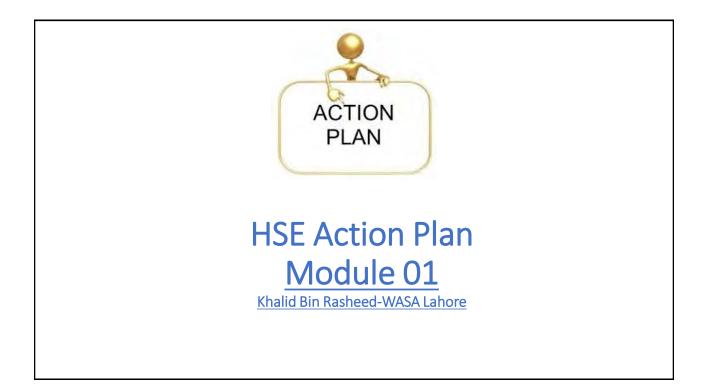
## • Action

- 1. Set the teams along with their targets and equipment.
- 2. Teams will be divided by the types of pipes e.g. AC pipes, GI pipes and HDPE pipes etc.

# • Evaluation

1. Check the flow meters and pressure recorders in pipe networks at night to identify the results and compare them with the past results.

Annex 3.66 Action Plan for O&M of Sewer and Storm Water Drainage in Spring 2017

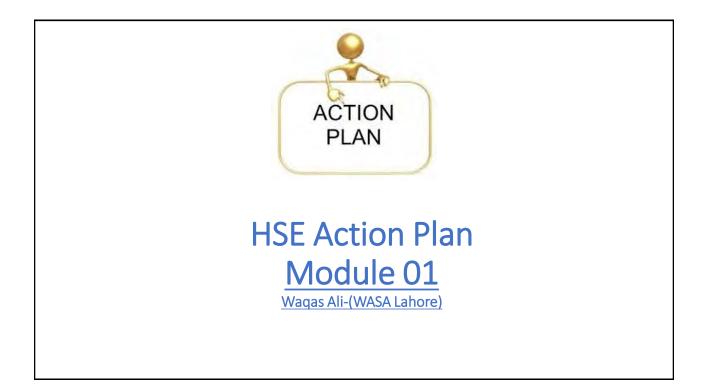


| Α | DESCR                   | RIPTION OF PR  | OBLEM              |           |                      |              |  |  |  |
|---|-------------------------|----------------|--------------------|-----------|----------------------|--------------|--|--|--|
|   |                         |                |                    |           |                      |              |  |  |  |
| 1 | Descript                | ion of Problem | Desilting of drair |           |                      |              |  |  |  |
|   | Date 15-02-17           |                |                    |           |                      |              |  |  |  |
|   |                         |                |                    |           |                      |              |  |  |  |
|   | Type / Rating of Hazard |                | Major              |           | Probable<br>Outcomes | Death        |  |  |  |
| 2 |                         |                | Moderate           |           |                      | Drowning     |  |  |  |
|   |                         |                | Minor              |           | outcomes             |              |  |  |  |
|   |                         |                |                    |           |                      |              |  |  |  |
|   | Hazard                  | Discovered     |                    |           |                      |              |  |  |  |
| 3 | Through                 |                | Inspection         | Near Miss | Accident             | Any<br>Other |  |  |  |
|   |                         |                |                    |           |                      | Other        |  |  |  |

| В            | IMMEDIATE ACTION       |              |                              |             |                  |                    |  |  |
|--------------|------------------------|--------------|------------------------------|-------------|------------------|--------------------|--|--|
|              |                        |              |                              |             |                  |                    |  |  |
| 1<br>Date of |                        |              | Remove Hazard                | How?        |                  |                    |  |  |
|              | Таке Ітте              | diate Action | Isolate Hazard               | How?        |                  |                    |  |  |
|              |                        |              | Restrict the Access          | How?        |                  |                    |  |  |
|              | Date of<br>Response    | 15-02-17     | Erect Signage                | How?        | By using ora     | nge cones and PPEs |  |  |
|              | Response               |              | Any Other                    | How?        |                  |                    |  |  |
|              |                        |              |                              |             |                  |                    |  |  |
|              |                        |              | Apply "5Whys"<br>Methodology | Because o   | f the lack of in | dicators or boards |  |  |
| 2            | Finding Root           | Cause        |                              |             |                  |                    |  |  |
|              |                        |              |                              |             |                  |                    |  |  |
|              |                        |              |                              |             |                  |                    |  |  |
|              |                        |              | Lack of Training             | Un-Safe O   | &M Method        | Ignorance          |  |  |
| 3            | Contributing<br>Causes | Reasons /    | No Use of PPE                | Lack of Pro | oper Tools       | Willful Misconduct |  |  |
|              |                        |              | Improper House<br>Keeping    | Improper    | Maintenance      | Any Other          |  |  |

|            |                        |   | (                               | C - Action Plan Te  | mplate |                |        |                      |                             |
|------------|------------------------|---|---------------------------------|---|--------|----------------|--------|----------------------|-----------------------------|
|            | 1                      | 2   | 3                               | 4   | 5      |                | 6      | ) (                  | 7                           |
| Sr.<br>No. | WHAT TO<br>DO?         | HOW TO<br>DO?   | WHEN TO<br>DO?                  | WHO TO DO?  |        | DO WITH V      | WHAT?  | CHECK<br>DONE?       | WHO TO<br>CHECK?            |
|            | Preventive             | (Follow   | (Frequency)                     | (Carried out By)  |        | Materials      | Tools/ | How to               | Effectiven                  |
|            | Action                 | SOP)  |                                 | Class of Work   | Worker |                | Equip. | Check?               | ess to be<br>Checked<br>By? |
| 1          | Use<br>orange<br>cones | Cones<br>are apply<br>around                                    | Before the<br>O&M work<br>start | A field of manager<br>to this work  |        | Sign<br>boards |        | By visiting the area | Field in<br>charge          |
| 2          | Using sign<br>boards   | Sign<br>boars<br>apply<br>before or<br>after the<br>O&M<br>area |                                 | Manager give a<br>proper lecture to<br>workers before<br>works start and tell<br>them the hazard and<br>risk of field |        |                |        |                      |                             |

| Sr.<br>No.      | Due Date    | Dat          | te Complete    | Date Verified |         | Any New Ris<br>Developed | sk / Hazard |
|-----------------|-------------|--------------|----------------|---------------|---------|--------------------------|-------------|
|                 | 15-02-17    | 15-          | 02-17          | 16-02-17      |         |                          | No          |
|                 |             |              |                |               |         |                          |             |
|                 |             |              |                |               |         |                          |             |
| D- SI           | GNATURES    |              |                |               |         |                          |             |
|                 |             |              |                |               |         |                          |             |
| Imple           | menter Name |              | Khalid Bin Ras | heed          | Si      | gnature                  |             |
| Authority Title |             | WASA, Lahore |                | Si            | gnature |                          |             |

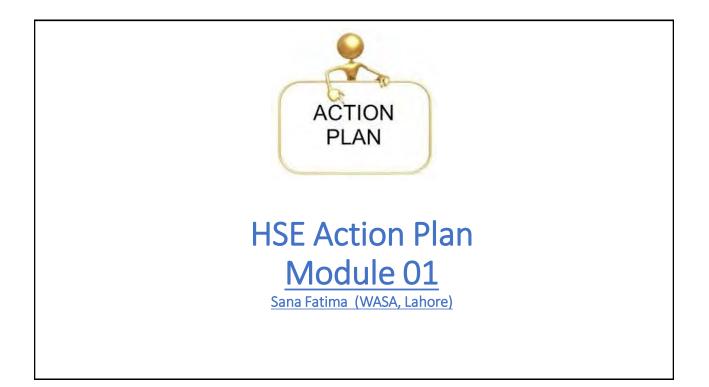


| Α | DESCR    | RIPTION OF PR   | OBLEM            |           |                      |              |               |
|---|----------|-----------------|------------------|-----------|----------------------|--------------|---------------|
|   |          |                 |                  |           |                      |              |               |
| 1 | Descript | ion of Problem  | Desilting of man | hole      |                      |              |               |
|   | Date     | 15/02/-17       |                  |           |                      |              |               |
|   |          |                 |                  |           |                      |              |               |
|   |          |                 | Major            | Death     |                      | Death of     | sewer manhole |
| 2 | Type / R | ating of Hazard | Moderate         |           | Probable<br>Outcomes |              |               |
|   |          |                 | Minor            |           | Outcomes             |              |               |
|   |          |                 |                  |           |                      |              |               |
|   | Hazard [ | Discovered      |                  |           |                      |              | Inspection    |
| 3 | Through  |                 | Inspection       | Near Miss | Accident             | Any<br>Other | Ignorance     |
|   |          |                 |                  |           |                      | Other        |               |

| В | IMMEDIA                | TE ACTION    |                              |              |                  |  |
|---|------------------------|--------------|------------------------------|--------------|------------------|--|
|   |                        |              |                              |              |                  |  |
|   |                        |              | Remove Hazard                | How?         |                  |  |
|   | Take Imme              | diate Action | Isolate Hazard               | How?         |                  |  |
| 1 |                        |              | <b>Restrict the Acces</b>    | s How?       |                  |  |
| _ | Date of<br>Response    |              | Erect Signage                | How?         |                  | ns, orange cones, tap<br>ing the working area                    |
|   |                        |              | Any Other                    | How?         |                  |  |
|   |                        |              |                              |              |                  |  |
| 2 | Finding Root           | Cause        | Apply "5Whys"<br>Methodology | in job , use | e PPEs , trainin | proper concentration<br>g to all staff before<br>de proper tools |
|   |                        |              |                              |              |                  |  |
|   |                        |              | Lack of Training             | Un-Safe O    | &M Method        | Ignorance  |
| 3 | Contributing<br>Causes | Reasons /    | No Use of PPE                | Lack of Pro  | oper Tools       | Willful Misconduct   |
|   |                        |              | Improper House<br>Keeping    | Improper I   | Maintenance      | Any Other  |

|            |                            |   | C - /                 | Action F         | Plan Tem | plate     |                  |                               |                      |
|------------|----------------------------|---|-----------------------|------------------|----------|-----------|------------------|-------------------------------|----------------------|
|            | 1                          | 2                                       | 3                     | 4                | )        | 5         |                  | 6                             | 7                    |
| Sr.<br>No. | WHAT TO<br>DO?             | HOW TO<br>DO?                           | WHEN TO<br>DO?        | <b>WHO TO</b>    | DO?      | DO WITH V | WHAT?            | CHECK DONE?                   | WHO TO<br>CHECK?     |
|            | Preventive                 | (Follow SOP)                            | (Frequency)           | (Carried         | out By)  | Materials | Tools/           | How to                        | Effectiveness        |
|            | Action                     |   |                       | Class of<br>Work | Worker   |           | Equip.           | Check?                        | to be<br>Checked By? |
| 1          | Training                   | Use the orange cones                    | Before the work start |                  | Workers  |           | Tools/<br>Equip. | By visit before<br>start work | Authorized person    |
| 2          | Lack of<br>proper<br>tools | Wait for<br>release the<br>hazard gases |                       |                  |          |           |                  |                               |                      |
| 3          | Provide<br>PPEs            | Impose the<br>PPEs                      |                       |                  |          |           |                  |                               |                      |

| Sr.<br>No. | Due Date    | Dat | te Complete | Date Verified | Any New R<br>Developed | lisk / Hazard |
|------------|-------------|-----|-------------|---------------|------------------------|---------------|
|            | 15/02/2017  | 15/ | /02/2017    | 15/02/2017    | No                     |               |
|            |             |     |             |               |                        |               |
|            |             |     |             |               |                        |               |
|            | GNATURES    |     |             |               |                        |               |
| D- 31      | GIVATORES   |     |             |               |                        |               |
| Imple      | menter Name |     | Waqas Ali   |               | Signature              |               |
| Autho      | ority Title |     | WASA Lahore | !             | Signature              |               |

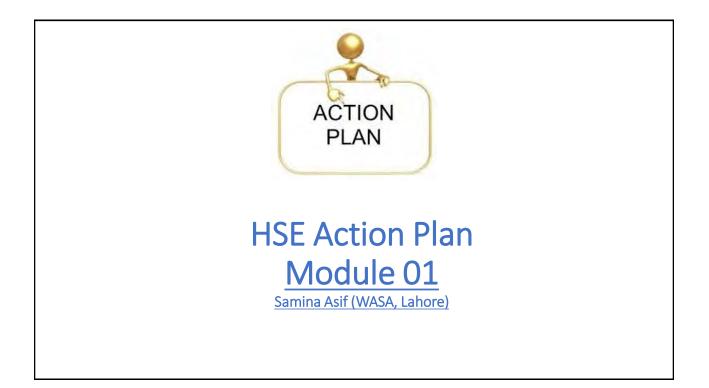


| Α | DESCR               | RIPTION OF PR   | OBLEM             |                 |                      |              |        |
|---|---------------------|-----------------|-------------------|-----------------|----------------------|--------------|--------|
|   |                     |                 |                   |                 |                      |              |        |
| 1 | Descript            | ion of Problem  | _ Damage to gas p | pipelines durin | g Drain dred         | ging         |        |
| - | Date                | 15-02-2017      |                   |                 | 0                    | 5 5          |        |
|   |                     |                 |                   |                 |                      |              |        |
|   |                     |                 | Major             |                 |                      | Leakage o    | of Gas |
| 2 | Type / R            | ating of Hazard | Moderate          |                 | Probable<br>Outcomes |              |        |
|   |                     |                 | Minor             |                 |                      |              |        |
|   |                     |                 |                   |                 |                      |              |        |
| 3 | Hazard I<br>Through | Discovered      | Inspection        | Near Miss       | Accident             | Any<br>Other |        |

| в | IMMEDIA                | TE ACTION    |                           |                        |                 |                 |      |
|---|------------------------|--------------|---------------------------|------------------------|-----------------|-----------------|------|
|   |                        |              |                           |                        |                 |                 |      |
|   |                        |              | Remove Hazard             | How?                   | By repairing    | gas pipelines   |      |
|   | lake Immed             | diate Action | Isolate Hazard            | How?                   | By cutting o    | ff gas supply   |      |
| 1 |                        |              | Restrict the Acces        | s How?                 | By using bar    | riers           |      |
|   | Date of<br>Response    |              | Erect Signage             | How?                   |                 |                 |      |
|   | nesponse               |              | Any Other                 | How?                   |                 |                 |      |
|   |                        |              |                           |                        |                 |                 |      |
|   |                        |              | Apply "5Whys"             | Why oper<br>carefully? | ator did not op | erate machine   |      |
| 2 | Finding Root           | Cause        | Methodology               | Why unsa               | fe O&M metho    | od was used?    |      |
|   |                        |              |                           | Why the c              | perator was n   | ot trained?     |      |
|   |                        |              |                           |                        |                 |                 |      |
|   |                        |              | Lack of Training          | Un-Safe O              | &M Method       | Ignorance       |      |
| 3 | Contributing<br>Causes | Reasons /    | No Use of PPE             | Lack of Pro            | oper Tools      | Willful Miscond | duct |
|   |                        |              | Improper House<br>Keeping | Improper               | Maintenance     | Any Other       |      |

|            |                                    |  | C - Action   | Plan Ter         | nplate  |           |        |                    |                            |
|------------|------------------------------------|--|--|------------------|---------|-----------|--------|--------------------|----------------------------|
|            | 1                                  | 2 3  | 4  |                  | 5       | )         | 6      | (                  | 7                          |
| Sr.<br>No. | WHAT TO<br>DO?                     | HOW TO DO?   | WHEN TO<br>DO?                                     | <b>WHO TO</b>    | DO?     | DO WITH V | VHAT?  | CHECK<br>DONE?     | WHO TO<br>CHECK?           |
|            | Preventive                         | (Follow SOP)   | (Frequency)  | (Carried o       | out By) | Materials | Tools/ | How to             | Effectivene                |
|            | Action                             |  |  | Class of<br>Work | Worker  |           | Equip. | Check?             | ss to be<br>Checked<br>By? |
|            | Training of<br>machine<br>operator | 1. Visit the site before dredging  | Train the<br>operator at<br>least twice<br>a month |                  |         |           | PPEs   | Sudden<br>checking |                            |
|            |                                    | 2. Prepare proper site<br>plan before starting   |  |                  |         |           |        |                    |                            |
|            |                                    | 3. Hand over plan to<br>operator and instruct<br>him if there is any<br>pipeline exist |  |                  |         |           |        |                    |                            |

| Sr.<br>No. | Due Date    | Date Complete                 | Date Verified | Any New Ri<br>Developed | sk / Hazard |
|------------|-------------|-------------------------------|---------------|-------------------------|-------------|
|            |             |                               |               |                         |             |
|            |             |                               |               |                         |             |
|            |             |                               |               |                         |             |
|            |             |                               |               |                         |             |
| D- SI      | GNATURES    |                               |               |                         |             |
| Imple      | menter Name | Sana Fatima                   |               | Signature               |             |
| Autho      | ority Title | Assistant Dire<br>(WASA, Laho |               | Signature               |             |

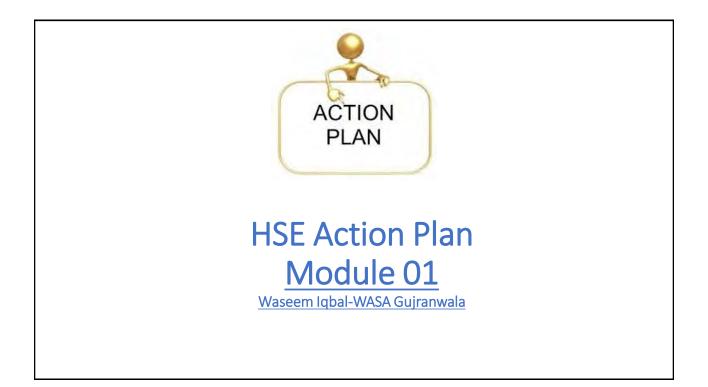


| Α | DESCR             | RIPTION OF PR    | OBLEM           |                |                      |              |        |
|---|-------------------|------------------|-----------------|----------------|----------------------|--------------|--------|
|   |                   |                  |                 |                |                      |              |        |
| 1 | Descript          | tion of Problem  | Damage to gas p | ipelines durin | g Drain drede        | zing         |        |
| - | Date              | 15-02-2017       |                 |                | 0                    | 50           |        |
|   |                   |                  |                 |                |                      |              |        |
|   |                   |                  | Major           |                |                      | Leakage      | of Gas |
| 2 | Type / F          | Rating of Hazard | Moderate        |                | Probable<br>Outcomes |              |        |
|   |                   |                  | Minor           |                |                      |              |        |
|   |                   |                  |                 |                |                      |              |        |
| 3 | Hazard<br>Through | Discovered<br>า  | Inspection      | Near Miss      | Accident             | Any<br>Other |        |

| В | IMMEDIA                | TE ACTION    |                            |                         |                 |           |            |
|---|------------------------|--------------|----------------------------|-------------------------|-----------------|-----------|------------|
|   |                        |              |                            |                         |                 |           |            |
|   |                        |              | Remove Hazard              | How?                    | By repairing    | gas pipe  | elines     |
|   | lake Imme              | diate Action | Isolate Hazard             | How?                    | By cutting o    | ff gas su | oply       |
| 1 |                        |              | <b>Restrict the Access</b> | How?                    | By using bar    | riers     |            |
|   | Date of<br>Response    |              | Erect Signage              | How?                    |                 |           |            |
|   | neoponoe               |              | Any Other                  | How?                    |                 |           |            |
|   |                        |              |                            |                         |                 |           |            |
|   |                        |              | Apply "5Whys"              | Why opera<br>carefully? | itor did not op | erate m   | achine     |
| 2 | Finding Root           | Cause        | Methodology                | Why unsaf               | e O&M metho     | od was u  | sed?       |
|   |                        |              |                            | Why the o               | perator was n   | ot traine | d?         |
|   |                        |              |                            |                         |                 |           |            |
|   |                        |              | Lack of Training           | Un-Safe O               | &M Method       | Ignora    | nce        |
| 3 | Contributing<br>Causes | Reasons /    | No Use of PPE              | Lack of Pro             | per Tools       | Willful   | Misconduct |
|   |                        |              | Improper House<br>Keeping  | Improper I              | Maintenance     | Any Ot    | her        |

|            |                                    |  | C - Action   | Plan Ter         | nplate  |           |        |                    |                            |
|------------|------------------------------------|--|--|------------------|---------|-----------|--------|--------------------|----------------------------|
|            | 1                                  | 2 3  | 4  |                  | 5       | )         | 6      | (                  | 7                          |
| Sr.<br>No. | WHAT TO<br>DO?                     | HOW TO DO?   | WHEN TO<br>DO?                                     | <b>WHO TO</b>    | DO?     | DO WITH V | VHAT?  | CHECK<br>DONE?     | WHO TO<br>CHECK?           |
|            | Preventive                         | (Follow SOP)   | (Frequency)  | (Carried o       | out By) | Materials | Tools/ | How to             | Effectivene                |
|            | Action                             |  |  | Class of<br>Work | Worker  |           | Equip. | Check?             | ss to be<br>Checked<br>By? |
|            | Training of<br>machine<br>operator | 1. Visit the site before dredging  | Train the<br>operator at<br>least twice<br>a month |                  |         |           |        | Sudden<br>checking |                            |
|            |                                    | 2. Prepare proper site<br>plan before starting   |  |                  |         |           |        |                    |                            |
|            |                                    | 3. Hand over plan to<br>operator and instruct<br>him if there is any<br>pipeline exist |  |                  |         |           |        |                    |                            |

| Sr.<br>No. | Due Date     | Date Complete            | Date Verified | Any New Ris<br>Developed | sk / Hazard |
|------------|--------------|--------------------------|---------------|--------------------------|-------------|
|            |              |                          |               |                          |             |
|            |              |                          |               |                          |             |
|            |              |                          |               |                          |             |
|            |              |                          |               |                          |             |
| D- SI      | GNATURES     |                          |               |                          |             |
|            |              | Coursing Asif            |               | Circuit and              |             |
| Imple      | ementer Name | Samina Asif              |               | Signature                |             |
| Auth       | ority Title  | Assistant Dir<br>Lahore) | ector (WASA,  | Signature                |             |



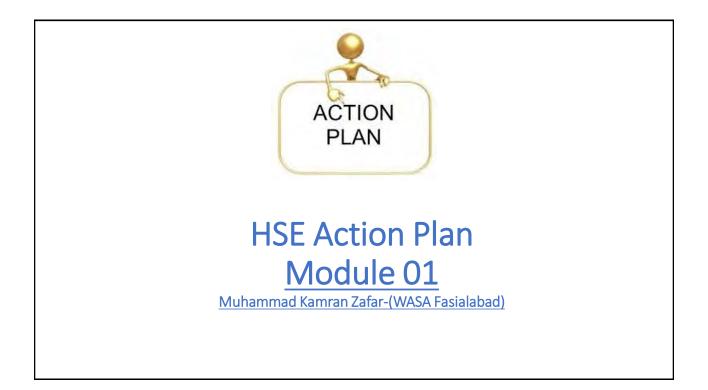
| ACT | ION | PLA | N |
|-----|-----|-----|---|
|     |     |     |   |

| Α | DESCRIPTION OF PROBLEM |                  |                 |  |          |   |           |  |  |  |  |
|---|------------------------|------------------|-----------------|--|----------|---|-----------|--|--|--|--|
|   |                        |                  |                 |  |          |   |           |  |  |  |  |
| 1 | Description of Problem |                  |                 | While desilt the M.H.<br>We have not any precaution measures, hazards & risk are there |          |   |           |  |  |  |  |
| - | Date 15-02-17          |                  | We have not any |  |          |   |           |  |  |  |  |
|   |                        |                  |                 |  |          |   |           |  |  |  |  |
| 2 | Type / F               | Rating of Hazard | Major           | Cause<br>death   | Probable | We have not any<br>arrangement as soon as<br>possible |           |  |  |  |  |
| _ |                        | 0                | Moderate        |  | Outcomes |   |           |  |  |  |  |
|   |                        |                  | Minor           |  | ]        |   |           |  |  |  |  |
|   |                        |                  |                 |  |          |   |           |  |  |  |  |
|   | Hazard                 | Discovered       |                 |  |          |   | Accidents |  |  |  |  |
| 3 | Through                |                  | Inspection      | Near Miss  | Accident | Any<br>Other  |           |  |  |  |  |
|   |                        |                  |                 |  |          | other   |           |  |  |  |  |

| В | IMMEDIA                | TE ACTION |                              |     |             |                            |        |                 |
|---|------------------------|-----------|------------------------------|-----|-------------|----------------------------|--------|-----------------|
|   |                        |           |                              |     |             |                            |        |                 |
|   | Take Immediate Action  |           | Remove Hazard                | l   | How?        | To make sur<br>(Proper PPE | •      | aution measures |
| _ |                        |           | Isolate Hazard               |     | How?        |                            |        |                 |
| 1 |                        |           | Restrict the Acc             | ess | How?        |                            |        |                 |
|   | Date of<br>Response    |           | Erect Signage                |     | How?        |                            |        |                 |
|   | hesponse               |           | Any Other                    |     | How?        |                            |        |                 |
|   |                        |           |                              |     |             |                            |        |                 |
|   |                        |           |                              |     |             |                            |        |                 |
| 2 | Finding Root Cause     |           | Apply "5Whys"<br>Methodology |     | Not proper  | rly managed                |        |                 |
|   |                        |           |                              |     |             |                            |        |                 |
|   |                        |           |                              |     |             |                            | 1      |                 |
|   |                        |           | Lack of Training             |     | Un-Safe O8  | &M Method                  | Ignor  | ance            |
| 3 | Contributing<br>Causes | Reasons / | No Use of PPE                |     | Lack of Pro | oper Tools                 | Willfu | ul Misconduct   |
|   |                        |           | Improper House<br>Keeping    |     | Improper N  | Maintenance                | Any C  | Other           |

|            |                    |                   | С              | - Actio          | n Plan Te       | emplate   |                 |                         |                      |
|------------|--------------------|-------------------|----------------|------------------|-----------------|-----------|-----------------|-------------------------|----------------------|
|            | 1                  | 2                 | 3              |                  | 4               | 5         |                 | 6                       | 7                    |
| Sr.<br>No. | WHAT TO<br>DO?     | HOW TO<br>DO?     | WHEN TO<br>DO? | wно то           | DO?             | DO WITH W | HAT?            | CHECK<br>DONE?          | WHO TO<br>CHECK?     |
|            | Preventive         | (Follow           | (Frequency)    | (Carried         | out By)         | Materials | Tools/Equip.    | How to                  | Effectiveness        |
|            | Action             | SOP)              |                | Class of<br>Work | Worker          |           |                 | Check?                  | to be Checked<br>By? |
| 1          | PPEs<br>necessary  | Step by<br>step   | Every week     |                  | Sub<br>Engineer | Equipment | Tools may<br>be | During<br>work<br>check | Senior officials     |
| 2          | Safety<br>measures | Very<br>important | Every week     |                  | Sub<br>Engineer | Awareness | Coordinate      | During<br>working       | Head officials       |
|            |                    |                   |                |                  |                 |           |                 |                         |                      |
|            |                    |                   |                |                  |                 |           |                 |                         |                      |
|            |                    |                   |                |                  |                 |           |                 |                         |                      |

| Sr.<br>No. | Due Date    | Date Complete | Date Verified | Any New Ri<br>Developed | sk / Hazard |
|------------|-------------|---------------|---------------|-------------------------|-------------|
| 1          | That date   |               |               | May be                  |             |
| 2          |             |               | By head       |                         |             |
| 3          |             |               |               |                         |             |
|            |             |               |               |                         |             |
| D- SI      | GNATURES    |               |               |                         |             |
| Imple      | menter Name |               |               | Signature               |             |
| Autho      | ority Title |               |               | Signature               |             |



| Α | DESCR                   | DESCRIPTION OF PROBLEM |  |           |          |                     |            |  |  |  |  |
|---|-------------------------|------------------------|--|-----------|----------|---------------------|------------|--|--|--|--|
|   |                         |                        |  |           |          |                     |            |  |  |  |  |
| 1 | Descript                | ion of Problem         | Remodeling of storm channel, as storm channel is damaged |           |          |                     |            |  |  |  |  |
|   | Date                    | 5-3-16                 |  |           |          |                     |            |  |  |  |  |
|   |                         |                        |  |           |          |                     |            |  |  |  |  |
|   |                         |                        | Major  |           | Probable | Accident<br>traffic | related to |  |  |  |  |
| 2 | Type / Rating of Hazard | Moderate               |  | Outcomes  | Workers  | causalities         |            |  |  |  |  |
|   |                         |                        | Minor  |           |          | Distresse           | S          |  |  |  |  |
|   |                         |                        |  |           |          |                     |            |  |  |  |  |
| 3 | Hazard I<br>Through     | Discovered             | Inspection   | Near Miss | Accident | Any<br>Other        |            |  |  |  |  |

| В              | IMMEDIA                | TE ACTION            |                              |                                  |            |                    |  |  |
|----------------|------------------------|----------------------|------------------------------|----------------------------------|------------|--------------------|--|--|
|                |                        |                      |                              |                                  |            |                    |  |  |
|                |                        |                      | Remove Hazard                | How?                             | Remodeling | is required        |  |  |
| Take Immediate |                        | diate Action         | Isolate Hazard               | How?                             |            |                    |  |  |
| 1              |                        |                      | <b>Restrict the Access</b>   | How?                             |            |                    |  |  |
|                | Date of<br>Response    | 14-4-16<br>Immediate | Erect Signage                | How?                             |            |                    |  |  |
|                | Response               | IIIIIIculate         | Any Other                    | How?                             |            |                    |  |  |
|                |                        |                      |                              |                                  |            |                    |  |  |
|                |                        |                      | • • <i>"</i> =>• <i>d</i> "  | Concrete channel is needed       |            |                    |  |  |
| 2              | Finding Root Cause     |                      | Apply "5Whys"<br>Methodology | It will be tolerant to discharge |            |                    |  |  |
|                |                        |                      | memouology                   | It is broken badly               |            |                    |  |  |
|                |                        |                      |                              |                                  |            |                    |  |  |
|                |                        |                      | Lack of Training             | Un-Safe O8                       | &M Method  | Ignorance          |  |  |
| 3              | Contributing<br>Causes | Reasons /            | No Use of PPE                | Lack of Pro                      | oper Tools | Willful Misconduct |  |  |
|                |                        |                      | Improper House<br>Keeping    | Improper Maintenance             |            | Any Other          |  |  |

|            |                       |                                      | C              | - Action Pla              | an Temp                  | late   |                          |  |                                   |
|------------|-----------------------|--------------------------------------|----------------|---------------------------|--------------------------|--|--------------------------|--|-----------------------------------|
|            | 1                     | 2                                    | 3              | 4                         |                          | 5  |                          | 6  | 7                                 |
| Sr.<br>No. | WHAT TO<br>DO?        | HOW TO<br>DO?                        | WHEN TO<br>DO? | WHO TO DO                 | ?                        | DO WITH V  | VHAT?                    | CHECK<br>DONE?                                 | WHO TO<br>CHECK?                  |
|            | Preventive            | (Follow                              | (Frequenc      | (Carried out              | By)                      | Materials  | Tools/Eq                 | How to   | Effectiveness                     |
|            | Action                | SOP)                                 | y)             | Class of<br>Work          | Worker                   |  | uip.                     | Check?   | to be<br>Checked By?              |
| 1          | Remodeling            | Make<br>concrete<br>channel<br>(RCC) | Immediate      | Engineering<br>department | Civil<br>related<br>work | Steel<br>bars,<br>cement,<br>sand<br>coarse<br>aggregate | Civil<br>Engg.<br>tools  | Properly<br>site visit,<br>material<br>testing | Engineers,<br>Govt.<br>Department |
| 2          | Site visit            | Regularly                            | Regularly      | Civil related             | Civil<br>related         | Man<br>power   | Follow<br>monitori<br>ng | Different<br>WASA<br>equipment                 | Govt.<br>Department               |
| 3          | Channel<br>monitoring | Professional staff                   | Immediate      | Civil related             | Workers                  | Man<br>power   | Follow<br>monitori       | Different<br>WASA                              | Govt.<br>Department               |

| Sr.<br>No.      | Due Date    | Dat             | Date Complete Date Verified Any New F<br>Developed |           |           | isk / Hazard |    |
|-----------------|-------------|-----------------|--|-----------|-----------|--------------|----|
|                 |             |                 |  |           |           |              |    |
|                 | 5-3-17      | 6-4             | -17  | 7-4-17    | No        |              | No |
|                 |             |                 |  |           |           |              |    |
|                 |             |                 |  |           |           |              |    |
| D- SI           | GNATURES    |                 |  |           |           |              |    |
| Imple           | menter Name |                 | Kamran   |           | Signature |              |    |
| Authority Title |             | WASA Fasialabad |  | Signature |           |              |    |



# HSE Action Plan Module 01

Salman Ahmed Hashmi (WASA, Fasialabad)

# **ACTION PLAN**

| Α | DESCR                        |                 | OBLEM   |   |          |   |  |  |  |  |  |
|---|------------------------------|-----------------|---|---|----------|---|--|--|--|--|--|
|   |                              |                 |   |   |          |   |  |  |  |  |  |
| 1 | Description of Problem       |                 | Sewer pipe damaged and sewer man working to repair the pipe and |   |          |   |  |  |  |  |  |
|   | Date                         | 15-02-17        | trainc managem  | traffic management during the repair work |          |   |  |  |  |  |  |
|   |                              |                 |   |   |          |   |  |  |  |  |  |
|   |                              |                 | Major   |   |          | Death may occur if<br>traffic not manage well,            |  |  |  |  |  |
| 2 | T                            | ation of Honord | Moderate  |   | Probable |   |  |  |  |  |  |
| 2 | туре / к                     | ating of Hazard | Minor   |   | Outcomes | If sewer man not use<br>proper PPEs during<br>repair work |  |  |  |  |  |
|   |                              |                 |   |   |          |   |  |  |  |  |  |
| 3 | Hazard Discovered<br>Through |                 | Inspection  | Near Miss                                 | Accident | Any<br>Other  |  |  |  |  |  |

| В | IMMEDIA                      | TE ACTION    |                              |             |                                      |          |                           |
|---|------------------------------|--------------|------------------------------|-------------|--------------------------------------|----------|---------------------------|
|   |                              |              |                              |             |                                      |          |                           |
|   | Take Imme                    | diate Action | Remove Hazard                | How?        | By plugging flow from d              |          | e to avoid over<br>d pipe |
|   |                              |              | Isolate Hazard               | How?        | By restricting public access to area |          |                           |
| 1 |                              |              | Restrict the Access          | How?        | By using bar<br>orange cone          |          | d tape and                |
|   | Date of<br>Response 15-02-17 | 15-02-17     | Erect Signage                | How?        | Work ahead signs and spe<br>signs    |          | and speed limit           |
|   |                              |              | Any Other                    | How?        |                                      |          |                           |
|   |                              |              |                              |             |                                      |          |                           |
| 2 | Finding Root                 | Cause        | Apply "5Whys"<br>Methodology | Pipe may b  | e damaging o                         | lue to a | geing                     |
|   |                              |              |                              |             |                                      |          |                           |
|   |                              |              | Lack of Training             | Un-Safe O8  | kM Method                            | Ignor    | ance                      |
| 3 | Contributing<br>Causes       | Reasons /    | No Use of PPE                | Lack of Pro | per Tools                            | Willfu   | Il Misconduct             |
|   |                              |              | Improper House<br>Keeping    | Improper N  | Aaintenance                          | Any C    | Other                     |

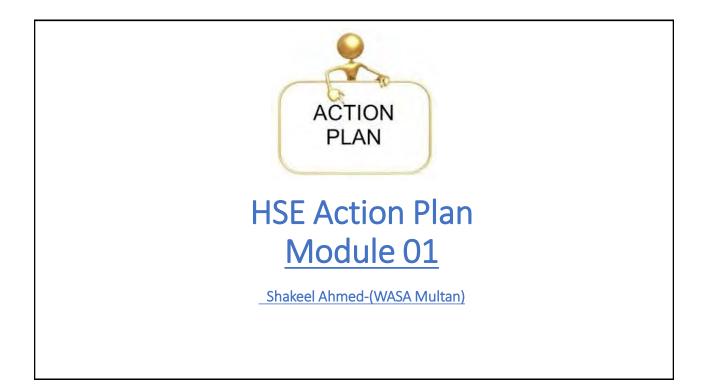
# C - Action Plan Template

|            | 1  | 2  | 3  | 4                     |        | 5                            |               | 6  | 7                    |
|------------|--|--|--|-----------------------|--------|------------------------------|---------------|--|----------------------|
| Sr.<br>No. | WHAT TO<br>DO?   | HOW TO<br>DO?  | WHEN TO<br>DO?   | WHO TO DO?            |        | DO WITH WHAT?                |               | CHECK DONE?  | WHO TO<br>CHECK?     |
|            | Preventive   | (Follow  | (Frequency)  | (Carried ou           | t By)  | Materials                    | Tools/        | How to   | Effectiveness        |
|            | Action   | SOP)   |  | Class of<br>Work      | Worker |                              | Equip.        | Check?   | to be<br>Checked By? |
| 1          | Collect all PPEs<br>before starting<br>the repair work | Enroute/divert<br>the traffic  | For Generators/<br>Vehicles, refer to<br>owner manual for<br>when to do<br>preventive<br>maintenance     | Generator<br>operator |        | As desired by<br>the machine | As<br>desired | By maintaining a<br>record, checking log<br>book having a<br>record when the<br>pipe were laid | Engineer in-charge   |
| 2          | Site visit   | Using safety<br>harness while<br>lower the<br>sewer man for<br>starting repair<br>work | Shelf life of pipe<br>should be<br>calculated by<br>taking average and<br>checking design<br>age of pipe | Sewer<br>supervisor   |        |                              |               |  |                      |
| 3          | Maintaining<br>the record and<br>cross checking        | He must be in<br>proper safety<br>dress with<br>SCBA                                   |  | Sub-Engineer          |        |                              |               |  |                      |

# C- Action Plan Template

| Sr.<br>No. | Due Date   | Date Complete | Date Verified | Any New Risl<br>Developed | < / Hazard |
|------------|------------|---------------|---------------|---------------------------|------------|
|            |            |               |               |                           |            |
|            | 15-03-2017 | 17-03-2017    | 18-03-2017    | N/A                       |            |
|            |            |               |               |                           |            |

| D- SIGNATURES    |                                     |           |  |
|------------------|-------------------------------------|-----------|--|
| Implementer Name | Salman Ahmed Hashmi                 | Signature |  |
| Authority Title  | Deputy Director WASA,<br>Faisalabad | Signature |  |



|   |                         |                       | ACTION                                    | I PLAN         |                      |   |   |  |  |  |  |  |
|---|-------------------------|-----------------------|---|----------------|----------------------|---|---|--|--|--|--|--|
| Α | DESCR                   | ESCRIPTION OF PROBLEM |   |                |                      |   |   |  |  |  |  |  |
|   |                         |                       |   |                |                      |   |   |  |  |  |  |  |
| 1 | Descript                | ion of Problem        | Sewage blockage                           | e in loha mark | et dia of 36"        |   |   |  |  |  |  |  |
| - | Date                    | 03-02-2017            | Sewage blockage in loha market dia of 36" |                |                      |   |   |  |  |  |  |  |
|   |                         | •                     |   |                |                      |   |   |  |  |  |  |  |
|   |                         |                       | Major                                     |                |                      | Stay out water is over                      |   |  |  |  |  |  |
| 2 | Type / Rating of Hazard |                       | Moderate                                  |                | Probable<br>Outcomes | buried in different<br>Areas/ People facing |   |  |  |  |  |  |
|   |                         |                       | Minor                                     |                | Outcomes             | problems                                    |   |  |  |  |  |  |
|   |                         |                       |   |                |                      |   |   |  |  |  |  |  |
| 2 | Hazard D<br>Through     | Discovered            | Inspection                                | Near Miss      | Accident             | Any   | Of proper<br>desilting of<br>sewer lines<br>then no |  |  |  |  |  |
|   | mough                   |                       | Inspection                                |                | Accident             | Other                                       | chance of<br>blockage<br>occurred                   |  |  |  |  |  |

| В | IMMEDIA                       | <b>TE ACTION</b> |                              |   |                                   |   |                |  |
|---|-------------------------------|------------------|------------------------------|---|-----------------------------------|---|----------------|--|
|   |                               |                  |                              |   |                                   |   |                |  |
|   |                               |                  | Remove Hazard                | How?                                    | To plan the o<br>sewers           | desilting   | schedule of    |  |
| _ | Take Immedia                  | ate Action       | Isolate Hazard               | How?                                    | To manage t<br>water              | he othe   | r way stagnant |  |
| 1 |                               |                  | Restrict the Access          | How?                                    | To provides                       | the pum   | ips            |  |
|   | Date of<br>Response 05-01-201 | 05-01-2017       | Erect Signage                | How?                                    |                                   | Use the warning where labour are working and stagnant water ahead |                |  |
|   |                               |                  | Any Other                    | How?                                    | Pump are install to pump out wate |   |                |  |
|   |                               |                  |                              |   |                                   |   |                |  |
|   |                               |                  |                              | Skilled labour are working at site      |                                   |   |                |  |
| 2 | Finding Root                  | Cause            | Apply "5Whys"<br>Methodology | All the apparatus are available at site |                                   |   |                |  |
|   |                               |                  | wiethouology                 | To maintain                             | machinery at                      | site  |                |  |
|   |                               |                  |                              |   |                                   |   |                |  |
|   |                               |                  | Lack of Training             | Un-Safe O8                              | M Method                          | Ignora  | ance           |  |
| 3 | Contributing<br>Causes        | Reasons /        | No Use of PPE                | Lack of Pro                             | per Tools                         | Willfu  | Il Misconduct  |  |
| 5 | Causes                        |                  | Improper House<br>Keeping    | Improper N                              | laintenance                       | Any C   | other          |  |

|            | C - Action Plan Template        |   |                                  |  |                       |                 |  |   |                                       |  |  |  |
|------------|---------------------------------|---|----------------------------------|--|-----------------------|-----------------|--|---|---------------------------------------|--|--|--|
|            | 1                               | 2   | 3                                | 4  |                       | 5               |  | 6   | 7                                     |  |  |  |
| Sr.<br>No. | WHAT TO<br>DO?                  | HOW TO<br>DO?                             | WHEN TO<br>DO?                   | WHO TO D                                 | 00?                   | DO WITH W       | /HAT?                                  | CHECK<br>DONE?                                | WHO TO<br>CHECK?                      |  |  |  |
|            | Preventive<br>Action            | (Follow<br>SOP)                           | (Frequency)                      | (Carried or<br>Class of<br>Work          | ut By)<br>Worker      | Materials       | Tools/<br>Equip.                       | How to<br>Check?                              | Effectiveness<br>to be<br>Checked By? |  |  |  |
| 1          | Desilting<br>schedule           | Provide<br>the all<br>safety<br>equipment | Daily team<br>moved to<br>desilt | Desilting<br>of sewer                    | Sewer<br>man          | Buckets<br>etc. | Self<br>breath<br>ing<br>appara<br>tus | When labour<br>start work ,<br>visit the site | A.D and Sub<br>-Engineer              |  |  |  |
| 2          | Desilting<br>team<br>check time | all safety<br>apparatus<br>available      | Tea working<br>hours<br>checked  | How<br>much<br>sewer<br>line<br>desilted | No of<br>sewer<br>man |                 |  |   | Sub-<br>Engineer                      |  |  |  |

| Sr.<br>No. | Due Date    | Dat | te Complete  | Date Verified | Any New<br>Develope | Risk / Hazard<br>d |
|------------|-------------|-----|--------------|---------------|---------------------|--------------------|
|            | 03-01-2017  | 20- | 01-2017      | 17-01-2017    | Sewer<br>blockage   |                    |
|            | 21-01-2017  | 13- | 01-2017      | 11-01-2017    | Action<br>Complete  | d                  |
|            |             |     |              |               |                     |                    |
| D- SI      | GNATURES    |     |              |               |                     |                    |
| Imple      | menter Name |     | Shakeel Ahme | ed (S.E)      | Signature           |                    |
| Autho      | ority Title |     | WASA Multar  | 1             | Signature           |                    |



# HSE Action Plan Module 01

Zia Ur Rehman-WASA Multan

# **ACTION PLAN**

| Α | DESCR                  | RIPTION OF PRO  | OBLEM  |           |                      |   |  |  |  |  |
|---|------------------------|-----------------|--|-----------|----------------------|---|--|--|--|--|
|   |                        |                 |  |           |                      |   |  |  |  |  |
| 1 | Description of Problem |                 | Desilting of manhole (Manhole is a silted and my team have to desilt |           |                      |   |  |  |  |  |
|   | Date                   | 15-2-17         | it)  |           |                      |   |  |  |  |  |
|   |                        |                 |  |           |                      |   |  |  |  |  |
|   |                        |                 | Major  |           |                      | Sewer man may affected with gases               |  |  |  |  |
| 2 | Type / R               | ating of Hazard | Moderate   |           | Probable<br>Outcomes | Sewer man may fall into the manhole             |  |  |  |  |
|   |                        |                 | Minor  |           |                      | An accident may occur if traffic not controlled |  |  |  |  |
|   |                        |                 |  |           |                      |   |  |  |  |  |
| 3 | Hazard I<br>Through    | Discovered<br>I | Inspection   | Near Miss | Accident             | Any<br>Other                                    |  |  |  |  |

| В | IMMEDIA   | TE ACTION |                              |             |                                  |                                      |                              |  |
|---|---|-----------|------------------------------|-------------|----------------------------------|--------------------------------------|------------------------------|--|
|   |   |           |                              |             |                                  |                                      |                              |  |
|   |   | P . A     | Remove Hazard                | How?        | Traffic are re<br>controlled     | emoved                               | l and traffic is             |  |
| 1 | Take Immediate Action       1       Date of<br>Response     17-2-17 |           | Isolate Hazard               | How?        | Gases are de<br>detector         | Gases are detected with gas detector |                              |  |
| - |   |           | Restrict the Access          | How?        |                                  |                                      |                              |  |
|   |   |           | Erect Signage                | How?        |                                  |                                      |                              |  |
|   |   |           | Any Other                    | How?        |                                  |                                      |                              |  |
|   |   | •         |                              |             |                                  |                                      |                              |  |
| 2 | Finding Root  | : Cause   | Apply "5Whys"<br>Methodology | , , ,       | s occur before<br>ery time and i |                                      | hazard are<br>dered as major |  |
|   |   |           |                              |             |                                  |                                      |                              |  |
|   |   |           | Lack of Training             | Un-Safe O8  | &M Method                        | Ignora                               | ance                         |  |
| 3 | Contributing<br>Causes  | Reasons / | No Use of PPE                | Lack of Pro | per Tools                        | Willfu                               | ul Misconduct                |  |
|   |   |           | Improper House<br>Keeping    | Improper N  | laintenance                      | Any C                                | )ther                        |  |

# C - Action Plan Template

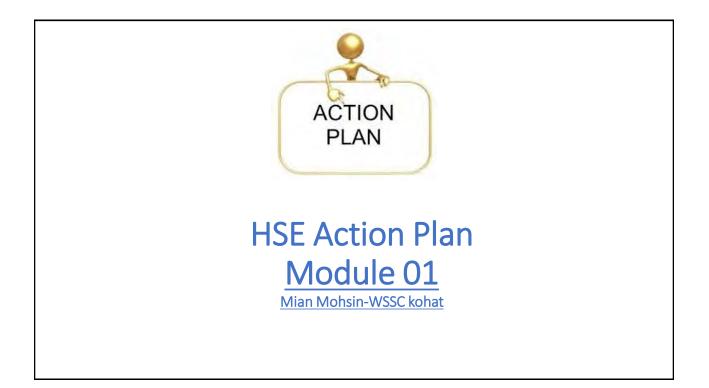
|       |          |          |   |   | $\frown$ |
|-------|----------|----------|---|---|----------|
| 1     | 2        | <b>A</b> | 5 | 6 | 7        |
| - · · | <b>J</b> | - /      |   |   | • )      |
|       |          |          |   |   |          |
|       |          |          |   |   |          |

| Sr.<br>No. | WHAT TO<br>DO?   | HOW TO DO?  | WHEN TO DO?                                   | <b>WHO TO</b>    | DO?     | DO WITH WHA | π?     | CHECK DONE?                        | WHO TO<br>CHECK?          |
|------------|--|---|---|------------------|---------|-------------|--------|------------------------------------|---------------------------|
|            | Preventive   | (Follow SOP)  | (Frequency)                                   | (Carried o       | out By) | Materials   | Tools/ | How to Check?                      | Effectivenes              |
|            | Action   |   |   | Class of<br>Work | Worker  |             | Equip. |                                    | s to be<br>Checked<br>By? |
| 1          | Design should<br>be so that<br>desilting may<br>be minimum | We should<br>design sewer<br>line as self<br>cleaning<br>velocity should<br>be obtain | Before laying<br>sewer line                   | ·                |         | Engineering |        | Desilting should<br>be minimum     | By Engr.                  |
| 2          | Training should<br>given to the<br>workers                 | By helding<br>training session  | At start of<br>employment and<br>every years  | V                |         |             |        | Interview should be done           | Managers                  |
| 3          | PPEs and<br>equipment<br>should be<br>available            | Should manage<br>the PPEs   | Each and every<br>time should be<br>available | V                | V       |             | V      | Check the<br>equipment and<br>PPEs | Supervisor                |

## C- Action Plan Template

| Sr.<br>No. | Due Date | Date Complete | Date Verified | Any New Risl<br>Developed | < / Hazard |
|------------|----------|---------------|---------------|---------------------------|------------|
|            | 16-02-17 | 17-02-17      | 17-02-17      | No                        |            |
|            |          |               |               |                           |            |
|            |          |               |               |                           |            |

| D- SIGNATURES    |               |           |  |
|------------------|---------------|-----------|--|
| Implementer Name | Zia Ur Rehman | Signature |  |
| Authority Title  |               | Signature |  |

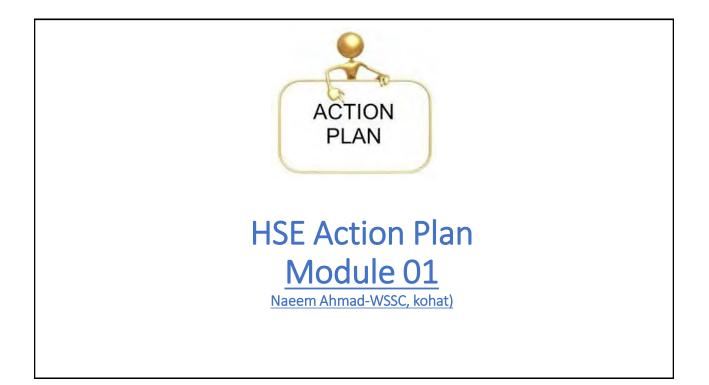


| Α | DESCR    | IPTION OF PR   | DBLEM          |                             |                      |                     |     |  |  |  |  |
|---|----------|----------------|----------------|-----------------------------|----------------------|---------------------|-----|--|--|--|--|
|   |          |                |                |                             |                      |                     |     |  |  |  |  |
| 1 | Descript | ion of Problem | Problem: Desil | Problem: Desilting of sewer |                      |                     |     |  |  |  |  |
| - | Date     | 15-02-17       |                |                             |                      |                     |     |  |  |  |  |
|   |          |                |                |                             |                      |                     |     |  |  |  |  |
|   |          |                | Major          |                             | Probable<br>Outcomes | Head inj            | ury |  |  |  |  |
| 2 | -        | Moderate       |                | Unconscious                 |                      |                     |     |  |  |  |  |
|   |          |                | Minor          |                             | outcomes             | Brain damaged/death |     |  |  |  |  |
|   |          |                |                |                             |                      |                     |     |  |  |  |  |
|   | Hazard [ | Discovered     |                |                             |                      |                     |     |  |  |  |  |
| 3 | Through  |                | Inspection     | Near Miss                   | Accident             | Any<br>Other        |     |  |  |  |  |
|   |          |                |                |                             |                      | Other               |     |  |  |  |  |

| В | IMMEDIA                | TE ACTION    |                              |   |               |  |                |  |
|---|------------------------|--------------|------------------------------|---|---------------|--|----------------|--|
|   |                        |              |                              |   |               |  |                |  |
|   | Take Imme              | diate Action | Remove Hazard                | How?  |               | Remove al the covers of sewers providing oxygen from outside |                |  |
| _ |                        |              | Isolate Hazard               | How?  |               |  |                |  |
| 1 |                        |              | <b>Restrict the Access</b>   | How?  | Starting pe   | g permit to work system                                      |                |  |
|   | Date of<br>Response    |              | Erect Signage                | How?  |               |  |                |  |
|   | Response               |              | Any Other                    | How?  |               |  |                |  |
|   |                        | •            |                              |   |               |  |                |  |
|   |                        |              | a l "mad "                   | 1) Not use  | ed PPEs 2) no | t providi  | ing by manager |  |
| 2 | Finding Root           | Cause        | Apply "5Whys"<br>Methodology | 3) Not available at store 4) budget not available |               |  |                |  |
|   |                        |              | memouology                   | 5) Applied  | d for budget  |  |                |  |
|   |                        |              |                              |   |               |  |                |  |
|   |                        |              | Lack of Training             | Un-Safe O   | &M Method     | Ignor  | ance           |  |
| 3 | Contributing<br>Causes | Reasons /    | No Use of PPE                | Lack of Pr  | oper Tools    | Willfu   | Il Misconduct  |  |
|   |                        |              | Improper House<br>Keeping    | Improper  | Maintenance   | Any C  | Other          |  |

|            |                                   |                               | C                   | - Action P                             | lan Temp | olate           |                    |                |                             |
|------------|-----------------------------------|-------------------------------|---------------------|--|----------|-----------------|--------------------|----------------|-----------------------------|
|            | 1                                 | 2                             | 3                   | 4                                      | I        | 5               |                    | 6              | 7                           |
| Sr.<br>No. | WHAT TO<br>DO?                    | HOW<br>TO DO?                 | WHEN TO<br>DO?      | WHO TO DO                              | ?        | DO WITH W       | 'HAT?              | CHECK<br>DONE? | WHO TO<br>CHECK?            |
|            | Preventive                        | (Follow                       | (Frequency)         | (Carried out                           | By)      | Materials       | Tools/             | How to         | Effectiveness               |
|            | Action                            | SOP)                          |                     | Class of<br>Work                       | Worker   |                 | Equip.             | Check?         | to be<br>Checked By?        |
| 1          | Providing<br>oxygen to<br>patient | Where<br>is<br>oxygen<br>muff | Time of<br>accident |  | workers  | Gas<br>detector | Oxyge<br>n<br>mask | supervisor     | Manager and<br>HSE officers |
| 2          | Calling 1122                      |                               |                     | Concern<br>Manager                     |          |                 | PPEs               |                | Supervisor                  |
| 3          | Shifted to<br>hospital            |                               |                     | HSE<br>Officers,<br>Concern<br>Manager |          |                 |                    |                |                             |

| Sr.<br>No. | Due Date    | Dat | e Complete  | Date Verified | Any New Risk / Hazard<br>Developed |                              | ( / Hazard |
|------------|-------------|-----|-------------|---------------|------------------------------------|------------------------------|------------|
|            |             |     |             |               |                                    |                              |            |
|            | 15/2/17     | 15/ | 2/17        | 15/2/17       |                                    | Insects<br>infection<br>etc. |            |
|            |             |     |             |               |                                    |                              |            |
|            |             |     |             |               |                                    |                              |            |
| D- SI      | GNATURES    |     |             |               |                                    |                              |            |
| Imple      | menter Name |     | Mian Mohsin | Gul           | Się                                | gnature                      |            |
| Autho      | rity Title  |     |             |               | Sig                                | gnature                      |            |

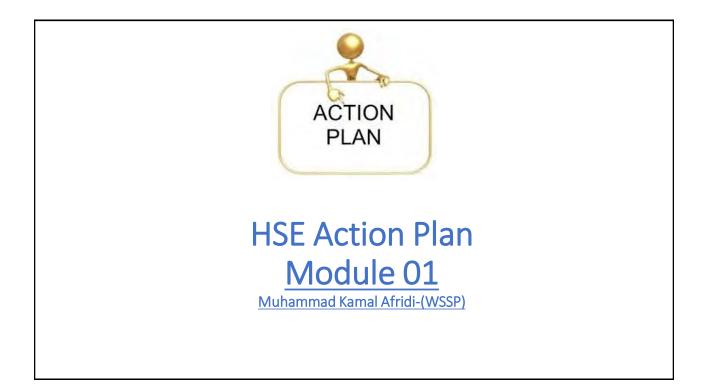


| Α | DESCR                   | IPTION OF PR   | OBLEM           | DBLEM                            |             |              |             |  |  |  |  |  |
|---|-------------------------|----------------|-----------------|----------------------------------|-------------|--------------|-------------|--|--|--|--|--|
|   |                         |                |                 |                                  |             |              |             |  |  |  |  |  |
| 1 | Descript                | ion of Problem |                 | Confined space (sewerage system) |             |              |             |  |  |  |  |  |
| - | Date                    | 15-2-2017      | Problem: "Suffo | cation"                          |             |              |             |  |  |  |  |  |
|   |                         |                |                 |                                  |             |              |             |  |  |  |  |  |
|   |                         |                | Major           |                                  |             | Unconscious  |             |  |  |  |  |  |
| 2 | Type / Rating of Hazard | Moderate       |                 | Probable<br>Outcomes             | Head injury |              |             |  |  |  |  |  |
|   |                         |                | Minor           |                                  | Outcomes    | Brain hemo   | orage/Death |  |  |  |  |  |
|   |                         |                |                 |                                  |             |              |             |  |  |  |  |  |
|   | Hazard D                | Discovered     |                 |                                  |             |              |             |  |  |  |  |  |
| 3 | Through                 |                | Inspection      | Near Miss                        | Accident    | Any<br>Other |             |  |  |  |  |  |
|   |                         |                |                 |                                  |             | other        |             |  |  |  |  |  |

| В | IMMEDIA                | TE ACTION               |                              |           |                         |                                      |             |  |
|---|------------------------|-------------------------|------------------------------|-----------|-------------------------|--------------------------------------|-------------|--|
|   |                        |                         |                              |           |                         |                                      |             |  |
|   | Take Imme              | diate Action            | Remove Hazard                | How?      | Removal of r<br>purging | Removal of manhole covering, purging |             |  |
| _ |                        |                         | Isolate Hazard               | How?      |                         |                                      |             |  |
| 1 |                        |                         | Restrict the Acce            | ss How?   | Introduce pe            | ermit to                             | work system |  |
|   | Date of<br>Response    | Immediate<br>15-02-2017 | Erect Signage                | How?      | Well before             | execution work                       |             |  |
|   | Nesponse               | 13-02-2017              | Any Other                    | How?      | Testing etc.            |                                      |             |  |
|   |                        |                         |                              |           |                         |                                      |             |  |
|   |                        |                         | A such a ((E) A (base))      | Because   | of engineering f        | ailures                              |             |  |
| 2 | Finding Root           | Cause                   | Apply "5Whys"<br>Methodology | Adminis   | Administration failures |                                      |             |  |
|   |                        |                         | methodology                  | PPEs      |                         |                                      |             |  |
|   |                        |                         |                              |           |                         |                                      |             |  |
|   |                        |                         | Lack of Training             | Un-Safe   | O&M Method              | Ignora                               | nce         |  |
| 3 | Contributing<br>Causes | Reasons /               | No Use of PPE                | Lack of F | Proper Tools            | Willful                              | Misconduct  |  |
|   |                        |                         | Improper House<br>Keeping    | Imprope   | er Maintenance          | Any Ot                               | ther        |  |

|            |                             |                          | C -  | Action Pla        | n Temp | late            |        |                |                      |
|------------|-----------------------------|--------------------------|--|-------------------|--------|-----------------|--------|----------------|----------------------|
|            | 1                           | 2                        | 3  | 4                 |        | 5               |        | 6              | 7                    |
| Sr.<br>No. | WHAT TO<br>DO?              | HOW<br>TO DO?            | WHEN TO DO?  | WHO TO DO         | ?      | DO WITH V       | VHAT?  | CHECK<br>DONE? | WHO TO<br>CHECK?     |
|            | Preventive                  | (Follow                  | (Frequency)  | (Carried out      | By)    | Materials       | Tools/ | How to         | Effectiveness        |
|            | Action                      | SOP)                     |  | Class of<br>Work  | Worker |                 | Equip. | Check?         | to be Checked<br>By? |
| 1          | Inspection                  | Staff<br>training        | Before<br>operation                                  | Concerned manager |        | Gas<br>detected | PPEs   | HSE officers   | Manager<br>concern   |
| 2          | Purging                     | Safety<br>drills<br>etc. | Gas monitoring<br>after some time<br>depends on case | HSE officers      |        |                 |        | supervisor     | HSE officers         |
| 3          | Use of<br>suitable<br>tools |                          |  | Supervisor        |        |                 |        |                |                      |
| 4          | PPEs                        |                          |  |                   |        |                 |        |                |                      |

| Sr.<br>No. | Due Date                 | Dat | te Complete | Date Verified |     | Any New Risl<br>Developed | k / Hazard |
|------------|--------------------------|-----|-------------|---------------|-----|---------------------------|------------|
|            |                          |     |             |               |     |                           |            |
| 1          | Nearly miss<br>15-2-2017 |     |             |               |     | Fall hazard               |            |
|            |                          |     |             |               |     | More<br>causality         |            |
|            |                          |     |             |               |     |                           |            |
| D- SI      | GNATURES                 |     |             |               |     |                           |            |
| Imple      | menter Name              |     | Naeem Ahma  | d             | Sig | gnature                   |            |
| Autho      | ority Title              |     |             |               | Sig | gnature                   |            |

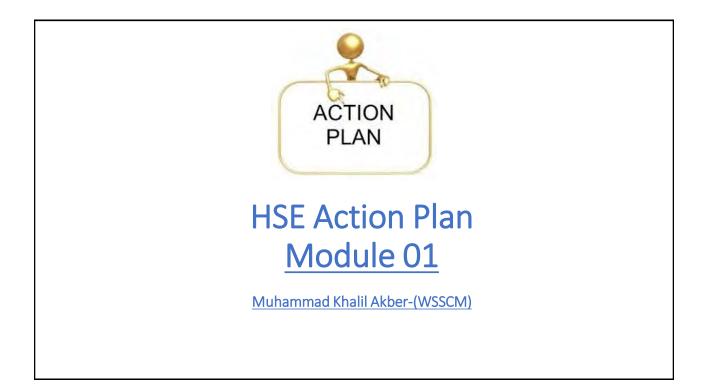


|   |   |              | ACTION  | I PLAN    |          |  |  |  |  |  |
|---|---|--------------|---|-----------|----------|--|--|--|--|--|
| Α | DESCR                                   | IPTION OF PR | OBLEM   |           |          |  |  |  |  |  |
|   |   |              |   |           |          |  |  |  |  |  |
| 1 | Description of Problem                  |              | While lowering into the manhole, the sewer man got suffocated & |           |          |  |  |  |  |  |
| - | Date                                    | 15/2/2017    | fainted.  |           |          |  |  |  |  |  |
|   |   | •            |   |           |          |  |  |  |  |  |
| 2 | Type / Rating of Hazard                 |              | Major   |           | Probable | Such an Accidents may<br>lead to the death of the<br>sewer man |  |  |  |  |
| - | .,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, |              | Moderate  |           | Outcomes |  |  |  |  |  |
|   |   |              | Minor   |           |          |  |  |  |  |  |
|   |   |              |   |           |          |  |  |  |  |  |
| 3 | Hazard Discovered<br>Through            |              | Inspection  | Near Miss | Accident | Any<br>Other   |  |  |  |  |
|   |   |              |   |           |          | Other  |  |  |  |  |

| В | IMMEDIATE A              | IMMEDIATE ACTION |                              |             |   |  |             |
|---|--------------------------|------------------|------------------------------|-------------|---|--|-------------|
|   |                          |                  |                              |             |   |  |             |
|   | Take Immediate Action    |                  | Remove Hazard                | How?        | By following                            | SOPs reg   | arding PPEs |
|   |                          |                  | Isolate Hazard               | How?        | Line Manage                             | Line Manager to play vigilant role   |             |
| 1 |                          |                  | Restrict the Access          | How?        |   | Sewer men not following SOPs, should be educated                             |             |
|   | Date of<br>Response      | 16/2/2017        | Erect Signage                | How?        |   | Informative pamphlets & stickers should<br>be produced for awareness raising |             |
|   |                          |                  | Any Other                    | How?        |   |  |             |
|   |                          |                  |                              |             |   |  |             |
|   |                          |                  |                              | PPEs r      | not followed                            |  |             |
| 2 | Finding Root (           | Cause            | Apply "5Whys"<br>Methodology | Line mana   | Line manager casual about the SOPs/PPEs |  |             |
|   |                          |                  |                              | Lack of ign | Lack of ignorance of hazardous effects  |  |             |
|   |                          |                  |                              |             |   |  |             |
|   |                          |                  | Lack of Training             | Un-Safe O   | &M Method                               | Ignora   | ince        |
| 3 | Contributing F<br>Causes | Reasons /        | No Use of PPE                | Lack of Pro | oper Tools                              | Willfu   | Misconduct  |
|   |                          |                  | Improper House<br>Keeping    | Improper I  | Maintenance                             | Any O  | ther        |

|           | C - Action Plan Template                         |  |   |                                       |   |   |  |  |
|-----------|--|--|---|---------------------------------------|---|---|--|--|
|           | 1  | 2  | 3   | 4                                     |   | 5   | 6  | 7  |
| Sr.<br>No | WHAT TO<br>DO?                                   | HOW TO DO?   | WHEN TO<br>DO?                                      | WHO TO DO                             | )?  | DO WITH<br>WHAT?  | CHECK DONE?  | WHO TO<br>CHECK?   |
| •         | Preventive                                       | (Follow SOP)   | (Frequency)   | (Carried out By)                      |   | Materials &   | How to Check?  | Effectiveness  |
|           | Action   |  |   | Class of<br>Work                      | Worker  | Tools/Equip.  |  | to be Checked<br>By?   |
| 1.        | Use of<br>PPEs<br>should be<br>made<br>mandatory | <ol> <li>Supervisor,<br/>line manager<br/>to ensure<br/>adherence to<br/>the SOPs</li> <li>Testing of<br/>gases</li> <li>Wearing<br/>PPEs</li> </ol> | Each time<br>when sewer<br>man enter<br>the manhole | Technician<br>to check<br>gases ratio | Sewer man<br>follow the<br>instruction<br>of the<br>supervisor<br>accordingly | 1. Gases<br>testing<br>machine<br>2. PPEs<br>(Goggles,<br>cylinder etc. | Supervisors<br>will ensure the<br>fulfilments of<br>the SOPs, Line<br>Manager will<br>check through<br>random spot<br>checking | Data base will<br>shoe the<br>happening of<br>the such event<br>like sewer man<br>suffocation.<br>This will show<br>that the SOPs<br>& checks are<br>not being<br>followed |

| Sr.<br>No.       | Due Date    | Date Complete | Date Verified | Any New Ris<br>Developed | sk / Hazard |
|------------------|-------------|---------------|---------------|--------------------------|-------------|
|                  |             |               |               |                          |             |
|                  | 28/2/2017   |               |               |                          |             |
|                  |             |               |               |                          |             |
|                  |             |               |               |                          |             |
| D- SIGNATURES    |             |               |               |                          |             |
| Implementer Name |             | Kamal Afridi  |               | Signature                |             |
| Autho            | ority Title | Zonal Manag   | ger           | Signature                |             |



| Α | DESCR                   | RIPTION OF PR   | OBLEM           |                              |                      |              |         |  |  |  |  |
|---|-------------------------|-----------------|-----------------|------------------------------|----------------------|--------------|---------|--|--|--|--|
|   |                         |                 |                 |                              |                      |              |         |  |  |  |  |
| 1 | Descript                | tion of Problem | Desilting Manho | Desilting Manhole 6 ft. deep |                      |              |         |  |  |  |  |
| - | Date                    | 15-02-17        |                 |                              |                      |              |         |  |  |  |  |
|   |                         |                 |                 |                              |                      |              |         |  |  |  |  |
|   |                         |                 | Major           |                              |                      |              |         |  |  |  |  |
| 2 | Type / Rating of Hazard |                 | Moderate        |                              | Probable<br>Outcomes | Become       | Injured |  |  |  |  |
|   |                         |                 | Minor           |                              |                      |              |         |  |  |  |  |
|   |                         |                 |                 |                              |                      |              |         |  |  |  |  |
|   | Hazard                  | Discovered      |                 |                              |                      |              |         |  |  |  |  |
| 3 | Through                 |                 | Inspection      | Near Miss                    | Accident             | Any<br>Other |         |  |  |  |  |
|   |                         |                 |                 |                              |                      | Other        |         |  |  |  |  |

| в | IMMEDIATE ACTION       |           |                            |   |                             |                              |               |
|---|------------------------|-----------|----------------------------|---|-----------------------------|------------------------------|---------------|
|   |                        |           |                            |   |                             |                              |               |
|   | Take Immediate Action  |           | Remove Hazard              | How?  | W? Give PPEs                |                              |               |
|   |                        |           | Isolate Hazard             | How?  | Stop worker                 | Stop workers for taking PPEs |               |
| 1 |                        |           | <b>Restrict the Access</b> | How?  |                             |                              |               |
|   | Date of<br>Response    | 15-02-17  | Erect Signage              | How?  |                             |                              |               |
|   | Response               |           | Any Other                  | How?  | Treatment to the workers    |                              |               |
|   |                        |           |                            |   |                             |                              |               |
|   |                        |           | Apply "5Whys"              | 1) Not taking PPEs 2) Ignorance 3) Lack of training |                             |                              |               |
| 2 | Finding Root           | Cause     | Methodology                | 4) Pressure   | 4) Pressure from supervisor |                              |               |
|   |                        |           |                            | 5) Imprope  | er supervisor a             | at highe                     | r level       |
|   |                        |           |                            |   |                             |                              |               |
|   |                        |           | Lack of Training           | Un-Safe O8  | &M Method                   | Ignora                       | ance          |
| 3 | Contributing<br>Causes | Reasons / | No Use of PPE              | Lack of Pro   | oper Tools                  | Willfu                       | Il Misconduct |
|   |                        |           | Improper House<br>Keeping  | Improper N  | Vaintenance                 | Any C                        | ther          |

| C - Action Plan Template |                  |               |                           |                  |                  |           |                     |                |                                |
|--------------------------|------------------|---------------|---------------------------|------------------|------------------|-----------|---------------------|----------------|--------------------------------|
|                          | 1                | 2             | 3                         | 4                |                  | 5         |                     | 6              | 7                              |
| Sr.<br>No.               | WHAT TO<br>DO?   | HOW TO<br>DO? | WHEN TO<br>DO?            | <b>WHO TO</b>    | DO?              | DO WITH V | WHAT?               | CHECK<br>DONE? | WHO TO<br>CHECK?               |
|                          | Preventive       | (Follow       | (Frequency)               | (Carried o       | (Carried out By) |           | Tools/Equip.        | How to         | Effectiveness<br>to be Checked |
|                          | Action           | SOP)          |                           | Class of<br>Work | Worker           |           |                     | Check?         | By?                            |
| 1                        | Providing<br>HSE | Yes           | Every time<br>before work |                  | Workers          |           | Tools/<br>Equipment | Site visit     | Manger                         |
|                          |                  |               |                           |                  |                  |           |                     |                |                                |
|                          |                  |               |                           |                  |                  |           |                     |                |                                |
|                          |                  |               |                           |                  |                  |           |                     |                |                                |
|                          |                  |               |                           |                  |                  |           |                     |                |                                |

| Sr.<br>No.       | Due Date    | Dat             | te Complete | Date Verified |         | Any New Ris<br>Developed | k / Hazard |
|------------------|-------------|-----------------|-------------|---------------|---------|--------------------------|------------|
|                  |             |                 |             |               |         |                          |            |
| 1                | 15-02-17    | 15-             | 02-17       | 15-02-17      |         | Slow<br>progress         |            |
|                  |             |                 |             |               |         |                          |            |
|                  |             |                 |             |               |         |                          |            |
| D- S             | IGNATURES   |                 |             |               |         |                          |            |
| Implementer Name |             | M. Khalil Akbar |             | Si            | gnature |                          |            |
| Auth             | ority Title |                 |             |               | Si      | gnature                  |            |

| Name         | Khalid Bin Rasheed         |
|--------------|----------------------------|
| Designation  | Sub Engineer               |
| Organization | WASA, Lahore               |
| Description  | Drain Dredging             |
| Area         | Drainage Directorate South |

### <u>Planning:</u>

First we a planning to perform the process in which machinery, labor and other safety equipment are used.

#### Machinery:

- Excavator
- Dumper

The qualities of machinery depend upon the area of O&M.

#### Safety Measures:

To control the traffic problem we need safety measures such as orange cones, warning tapes etc. and PPEs to prevent our labor from any incident.

#### Working:

Now we start the work of dredging to drain with the help of our machinery. First the excavator operator will be prepare for working and use PPEs then start the work. Excavator bucket capacity is 1 Ton dumper capacity of loading is 8 Ton. So, maximum 8 buckets are loaded in the dumper. Excavator bucket is a back hoe type usually a solid waste a present at the drain in Tons and this waste is present at the culvert. First of all we make boundary with orange cones arrange the O&M to prevent from hazardous as a serious accidents. Excavator after collect a bucket of sludge or solid waste, water release from the bucket. We do this action because we loaded more waste into the dumper.

After loading the dumper we have to dump the waste at dumping site, the dumping site of Lahore is at Gujjar Colony before move a dumper a driver or a labor person check the clamp of the truck. So on the way the back door of the dumper open and hazard is happened.

#### **Dumping Site:**

The dumping site of Lahore is at Gujjar Colony, but this site is not permanent dumping site. Their dumper can dump the waste. This waste is far away from the city. So that this site chosen for solid waste dump.

| Name         | Waqas Ali    |
|--------------|--------------|
| Designation  | Sub Engineer |
| Organization | WASA, Lahore |

#### **Description: Drain Dredging**

#### Area: drainage South, Length 5Km

#### **Planning:**

First of all we need to plan how to perform the process. We need machinery, Labour, money and resources etc.

#### Machinery:

| Machinery       | Quantity | Capacity  | Fuel consumption |
|-----------------|----------|-----------|------------------|
| Excavator       | 02       | 1.00 Tons | 14 liter         |
| Tractor trolley | 02       |           | 5 Km             |
| Dump truck      | 02       | 8 Ton     | 8 Km/l           |

#### Labour:

Machine operator = 06

Sewer man = 04

Supervisors = 01

Engineers = 01

First of all we need a visit the site and calculate the value of sludge in drain. Our survey team visits the drain and gives us some value of sludge in drain. Suppose the value of sludge is  $650 \text{ m}^3$ .

Now we are calculate the machinery required and we use the two excavator, two dumper and two tractor trolleys. The excavator is back hoe type and use of this machinery to remove the solid waste and sludge. Excavator put the solid waste and from the drain and put into the dump trucks. After the cleaning the drain our team transported the solid waste and sludge on the open area.

Many of hazardous are we can free during this process that why we planned the hazardous remove policy.

All the drivers are experienced holder and staff must use the PPEs like life line attentions, gloves, safety shoes, proper tools (SCBA), masks and proper guide line etc.

All the step perform the duty are fully and honesty with maximum safety factors. We get the permissions before the start of the work and signed on the worksheet like engineers and supervisors.

| Name        | Sana Fatima               |
|-------------|---------------------------|
| Designation | Assistant Director        |
| Activity    | Process of Drain Dragging |

## **Planning Phase:**

- Selection of site
- Nominate staff members for performing the subject activity
- Select the proper machinery required for dredging (Excavators, Dumping Trucks)
- Instruct the staff members to wear PPEs (Helmets, Safety shoes, gloves)
- Take traffic control equipment to avoid traffic hazard
- All the machinery capacity and staff requirement should be according to sludge volume. (calculation are explained at the end) then more toward site related for dredging.

## **Implementing phase:**

- First to void traffic hazards, segregates the work areas by isolating it with the help of traffic cones arrangement.
- Hydraulic man starts working
- Excavator will remove the solid waste wetted (sludge) into the trucks.
- When the truck is fully loaded with sludge, stop the working of excavator.
- Then instruct the driver to move toward the dumping site.

## **Closing Phase:**

- Select proper dumping site (Sludge) to avoid all type of hazards i.e. environmental, biological etc.
- Then instruct the truck driver to remove sludge carefully
- Then instruct the truck driver to move toward office

# **Sludge Volume Calculation:**

Sludge volume is calculated before drain dredging to estimate staff and machinery requirement. It is calculated by selected two locations (Foot Bridge) and by taking x-section of the drain at these two site. This activity is performed by taking these equipment:

- Staff disk arrangement (rod)
- Metallic tape
- Meter for distance measuring

The PPEs require for the sludge measurement are:

- Gloves
- Helmets
- Goggles
- Safety shoes

Staff member required: almost 2 members are required

## **Procedures:**

- 1. First avoid traffic hazard
- 2. Select avoid foot bridge-1 (for measuring depth of sludge width)
- 3. With the help of meter rod, measure total depth, then take depth of the drain at location-3 so that after subtracting it from the total depth of sludge may be taken.
- 4. Take width  $(B_1)$  at foot bridge-1
- 5. Then move toward the foot bridge-2 by taking wheel meter along with to measure distance between wo bridges(Li).
- 6. Then at foot bridge-2 measure the total depth of the drain, then perform same procedure to measure average depth at this section S'.
- 7. Then take average of S & S', which gives avg. depth
- 8. Measure width at location B<sub>2</sub>
- 9. Take avg. of  $B_1 \& B_2$  for ant width
- 10. Then measure length along other bank of drain (Lo)
- 11. Take avg. of Li & Lo, avg. length will be obtained

Then by using following formula:

#### Sludge Volume = $D_{(avg)} * B_{(avg)} * L_{(avg)}$

D(avg) = Depth of sludge

B(avg)= Width of sludge

L(avg)= Length of sludge

| Name         | Samina Asif        |
|--------------|--------------------|
| Designation  | Assistant Director |
| Organization | WASA, Lahore       |

#### **Process of Drain Dredging:**

#### 1 Planning Phase:

In planning phase length of drain should be decided where dredging is required

#### i. Site Survey:

After deciding the length of the drain a site survey must be carried out to examine the existing condition at site. This survey will give an idea about traffic and population around the drain which will help in efficient development of machinery and staff.

#### ii. Sludge Estimation:

Sludge estimation will be carried out before commencement of maintenance work.

For sludge estimation, equipment related to measuring depth & width must be arranged. Ranging Rods, safety shoes, gloves, mask and distance meter required.

After arriving at site, person responsible for sludge estimation must wear PPEs mentioned above. A proper plan for traffic management must also be adopted for safety purposes.

Traffic cones and Barrication tapes must be used to aware traffic about maintenance activity.

After ranging rod must be used to measure the sludge at center and both sides of the drain, and also to measure total depth of the drain.

The Average depth of sludge & width & length where cleaning is required, will give us sludge volume.

#### iii. Machinery:

On the basis of estimation of sludge volume, we will have an idea that how much machinery is required at site & how many trucks are required to transport the sludge from site to disposal point. Staff operation is also depending upon sludge volume,

#### 2 Implementation Phase:

After planning we are clear about site, sludge which we are going to handle. So, on the maintenance day, arrive at site with trained staff and proper machinery.

Divert the traffic any way from drain working area by using cones & flaggers. Deploy the machinery mainly excavator & start the operation.

#### 3 Handling/Disposal:

After collecting all the material from drain, remove the traffic diversions & move the vehicles to the to the Disposal point.

After reaching point, unload the truck safely. Make sure that no person is standing over there to avoid hazards from splashing.

After unloading, vehicles must return to the office for operational activity.

| Name         | Mirza Waseem Iqbal |
|--------------|--------------------|
| Organization | WASA Gujranwala    |
| Designation  | Sub-Engineer       |
| Date         | 17-02-2017         |

#### **Drain Dredging:**

#### Step 1:

First we have to know where we have to decide the area and its length of reach.

#### Step 2:

We manage the drain dredging with accessories like dump truck with man power immediately and before moving to site check the everything light and also the fuel as well.

#### Step 3:

We reach the site for dredging for and put in use the machinery.

#### Step 4:

As first we check the traffic flow at our site. Now we use cones in alignment and Barrication tape properly traffic. We should at least complete uniforms and PPEs

#### Step 5:

Now we placed our dragging at work area so that nobody will disturb you. put the dump truck nearest to the machine then is not only garbage thrown at the road.

#### Step 6:

Immediate work start and the dump ready to away this garbage to dispose outside the city.

#### Step 7:

The disposal material must be thrown to the site burnt and dig into the mud.

#### Step 8:

This wastage must inside the mud because it will not cause to disturb the water table underground.

#### Step 9:

Most important the water table is now disturbing at least 9 m water table deficient under the ground. So we face water loss at least 9 m.

#### **Step 10:**

After completion our assignment at site of work properly assemble the whole activity and safety things.

#### **Remarks:**

- 1. Safe of time
- 2. Safe of economy
- 3. Safe of fuel
- 4. Safe of more use of man power
- 5. Also the drain flow will proper after the desilted
- 6. It also the help of the budget of the concern WASA authority
- 7. It will increase our efficiency

| Name         | Shakeel Ahmed |
|--------------|---------------|
| Designation  | Sub Engineer  |
| Organization | WASA, Multan  |

#### **Drain Dredging:**

The dredging of the drain of Bohar Gate Shah Gervais is require. For this purpose, first we manage the machinery and helpers, and also make a time estimation plan to check in how many days this dredging work will be completed. After that we use following safety equipment to control the interference of the public:

- Safety cones
- Safety warning tape
- Signal board etc.

After completed the safety precautions, machinery and workers will send to the site. Before starting work, wear safety helmets and safety shoes. Sludge will lift with the help of excavator and dragger machine. The truck will lift in proper manner, avoid overloading. otherwise it will be falling on road during the movement of truck. And it is painful for public.

After loaded the truck, sludge removed on dumping site. During work, take care of the parts of machinery.

Where machinery or labours are working, site in charge must be at there and also first aid box should be there. In case of any emergency, initial treatment could provide to worker.

After completion, worker collect all the safety equipment and clear the area for public.

Before reaching the truck at office, its washing compulsory. The report of this activity will submitted to the concern Engineer.

If work not complete in one day, then mark the area and start the work from there on second day. It is easy way to complete the work as soon as possible.

| Name         | Zia Ur Rehman |
|--------------|---------------|
| Designation  | Sub Engineer  |
| Organization | WASA, Multan  |

#### **Title: Dredging of Drain**

#### **Objectives:**

The objective of this step to safe desuldging of drain and disposing the sludge in proper and safe way including its safe transportation.

#### Planning:

For dredging the drain we have to remove measures the sludge volume, by determining the sludge depth, X sectional depth of drain and length. And then machinery, labour, and safety equipment and fuel and then a place for safe disposal of sludge.

#### 1. Sludge Volume:

We have to dredge a drain of length 116.55 m and having X section (Width=2.4 m) and depth of sludge 0.2933 m by taking measurement on site.

Sludge volume =  $116.55 \times 2.4 \times 0.2933 = 82.046 \text{ m}^3$ 

#### 2. Machinery required:

We required an excavator with four dump trucks. For this purpose

#### 3. Fuel required:

For dump trucks = 0.33\*4\*(7\*2)\*3 = 56 liters

For Excavator = 14 \* 2 hrs.= 28 liters

Add 10 L for reaching at site = 28 + 10 = 38 L

Total fuel consumption = 94 L

#### 4. Labour Required:

#### For dump truck:

(Driver + Helpers)\*4

So four drivers with four helpers are required for this dump trucks.

For Excavator= operator + helper

#### Safety Equipment:

Nearly 12 safety cones and warning tapes and traffic reflections are required.

#### **PPEs:**

Helmets, goggles, gloves and safety shoes etc.

#### **Procedures:**

First of all sludge is measured and then planning for machinery and labour & equipment is done. After machinery is arranged. They are shifted to a site. On site first of all safety cones are placed for traffic control.

The dump truck is stopped in line on the side of road and excavator on starting point of site. The dredging is starting and dump truck are filled, when first is shifted it move toward disposing point which is 7 Km away from the site.

Nearly four turns of each dump truck is completed, after this completing dredging the excavator is shifted to the office and our task is completed.

The disposing is done by safe way in trucks and they are covered with sand or soil.

#### **Remarks:**

The task is completed in safe way and precautions have been followed.

| Name        | Muhammad Kamran Zafar |
|-------------|-----------------------|
| Designation | Assistant Director    |
| WASA        | Faisalabad            |

#### Drain dredging:

For the purpose of drain dredging, we required some machinery and staff. They are estimated as follow:

- 1) Staff
- 2) Gloves
- 3) Distance measuring wheel
- 4) Goggles
- 5) Orange cones
- 6) Barricaded tape
- 7) Dumping truck
- 8) Excavator (back hoe/front hoe)

First of all, we take a total depth of the channel by inserting staff deep inside the channel as its center by forcefully. Then we calculate a depth at which sludge start. It can be calculated very easily when a slight friction come on its way. Suppose full depth of the channel is 94 cm and depth at which a sludge start is 54 cm. Then we have total depth of the sludge 94-54=40 cm. similarly we shall calculate sludge start level at the end of channel width too. One support it is 60 and other end it is 64. So we shall have sludge level at ends

94-60=34 cm

94-64=30 cm

So we have three sludge level,

One end=34 cm

Middle=40 cm

Other end=30 cm

Average=34.66 cm

We shall also measure a width of the channel. Suppose that comes to be 220 cm. this whole calculation is for when you standing taking calculation from one bridge. Now move toward the other bridge and measure distance by measuring wheels. Distance must be taken from both side of the channel and take average of it

Distance between two footsteps (bridge) =100 m

#### =110 m

#### Average = 100 + 110 = 105 m

2

Also repeat the methods for sludge thickness at 2<sup>nd</sup> foot too. Suppose sludge thickness at 2<sup>nd</sup> foot step is

One end= 35 m

Middle= 45 m

Other end =45 m

Average= 38.33

Width of foot 2=230 m

Taking avg. of width of two foots= 220+230 = 225 cm

2

Now perform calculation is in meters.

Calculate sludge volume= 2.25\*105\*0.3649

 $= 86.2 m_3$ 

So we have calculated the volume of the sludge. Now we shall transport this volume to dump site by dump trucks. Suppose capacity of the dump truck is 10 m<sub>3</sub>. Sludge to dump site in nine goes

<u>86.2</u> = 8.62

10

So take it is nine.

| Name         | Salman Ahmed Hashmi          |
|--------------|------------------------------|
| Designation  | Assistant Director Technical |
| Organization | WASA, Faisalabad             |

#### **Title: Drain Dredging**

#### Action plan for drain dredging:

#### Machinery required:

- 1. Excavator or dredger machine
- 2. Dumper
- 3. PPEs
- 4. Manpower

First step for commencing the drain dredging is to make a traffic management plan. Normally drains are along road sides so traffic management plan is necessary. We use many orange cones, barricaded tapes and flaggers for controlling the traffic. Persons working at site must be in proper PPEs. It may include reflecting jackets, safety helmets, safety gloves and safety shoes. Next steps are as follow:

i. Calculate the volume of sludge in the drain by measuring the length, width and depth using different instrument. Length and width of drain can measuring by using distance measuring wheel and depth can measure by using staff/measuring rod having pointed bottom. The surface of sludge in the drain can be felt by the measuring rod and it should be subtracted from total depth of the drain. Following formula is to be used for calculating the volume of sludge

V = l\*w\*h

Where  $l = \underline{li+lo}_2$ w= width of the drain h= depth of the drain Let's take a complete of a drain having the following L= 115 m (length of drain to be desilted) Select two point W= 2.5 m (width of the drain to be desilted) H= 0.28 m (depth of sludge) V= 80.5 m3 (total sludge) V= 193.73 metric tons  $\frac{193.73}{8} = 24$  approx. A truck has a capacity to carrying 8 tons. We will need about 24 dump truck to carry sludge from drain to dumping site. Suppose the distance is 10 Km from the drain to dumping site and the fuel consumption of dump truck is 2 km/l, so 10 Km (going)+ 10 Km (come back)=20 Km

Each dump truck will need 10 liter. So, 24 dump truck will need 10 \* 24 = 240 liters Working capacity of excavator= 1 ton

Fuel consumption of excavator/backhoe= 10 L/h

Suppose it will take 50 hours, so it will consume 500 L fuel.

| Name        | Kamran Afridi        |
|-------------|----------------------|
| Designation | Zonal Manager (WSSP) |
| Activity    | Drain Dragging       |

### 1. <u>Planning:</u>

Before start the activity we need to correlate the various activities involved in the whole dredging process. Manager & in charge should make out the various requirement for the activity in term of manpower, machinery, expense foe POL, coordination with the line department like traffic police etc. after that chronological activities should be laid down on a paper.

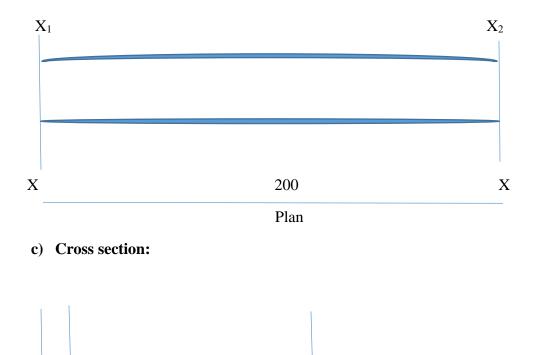
#### i. Activities:

4'

a) Dredging of 200 ft. drain with the cross section 8'\* 4"

8'

b) Plan of the drain



ii. **Man power:** helper = 4 Nos Driver = 1 Nos

iii. **Fuel requirement**: 100 liters

#### iv. Coordination:

Inform traffic police about activity with date and time.

#### v. Equipment:

Ranging rod, distance meter, measuring tape and excavator with back hoe bucket. Helmets for works and gloves.

### 2. Dredging Activity:

Upon reaching the dredging site, first of all traffic cones should be placed following the SOPs like traffic approach zones transition zone make area end zone and showing mark area work zone. After securing the work area with respect to the all sort of hazards like traffic etc. actual work should be started by following the steps as mentioned below.

• At X-Section I take measurement for overall depth of flow and depth of sludge at around three locations

## At poin-1:

- Overall depth of flow =3.5'
- Depth of water from surface up to sludge surface = 2.5'
- Depth of sludge = 1'

# At point-2:

- Overall depth of flow =3.5'
- Depth of water from surface up to sludge surface = 2.0'
- Depth of sludge = 1.5'

# At point-3:

- Overall depth of flow =3.5'
- Depth of water from surface up to sludge surface = 2.25'
- Depth of sludge = 1.25'
- Average depth of sludge = 1.25'

Now repeat the same procedure for  $XX_2$ 

After taking depth of sludge at both the section average of average should be calculated say (X ft.)

Now measure the length of the drain by using measuring meter. As the drain is in a curve, therefor reading should be taken along both banks of the drain. Centre line should be calculated by averaging both the measurement.

Now we have

Average depth of the drain =  $X_{ft}$ Average length of drain= 200 ft. X- Section of the sludge = 8\*4

Volume of sludge = X \* 200\*8'

 $= Y cf^3$ 

We will use tractor trolley having carrying capacity of 300 cft.

No of trolleys require =  $\underline{Y cf^3}$ 

300

Z number of trolleys will be required to clear the sludge.

| Name       | Mian Mohsin Gul |
|------------|-----------------|
| WSSC Kohat |                 |

**Activity** = Drain Dredging

# -> Planning:

- 1) Identify the 5000 ft. length of dredging
- 2) Arrangement of tractor trolley an excavator for carrying the sludge
- 3) Arrangement for man power
- 4) Taking traffic control measures
- 5) Providing of PPEs

# $\Box$ Procedures:

We have already calculated the volume of sludge in 500 ft. length and find out the 20 number of tractors of volume 2.5/100 cft. will which have needed for operation.

We arrange five number of trolley of 2.5/100 cft. volume to carry 4 Nos. Tripp site of sludge disposal site.

 $\overrightarrow{\gamma}$  PPEs used in this operation are Helmets, Goggles, Jackets, Boots, Traffic control equipment e.g. safety cones, signs etc.

 $\Rightarrow$  Equipment for measuring volume are:

- 1) Tape
- 2) Ranging rod
- 3) Goggles
- 4) Larger tap for measuring distance between selected points.

### **Conclusion Remarks:**

Operation accomplished in 10 hours, all the PPEs & traffic Control equipment are submitted to store room, the trolley has been washed and placed safely.

| Name     | Naeem Ahmed    |
|----------|----------------|
| Company  | WSSC, Kohat    |
| Activity | Drain Dragging |

# **Planning:**

# A. Inspection:

To calculate the silt in the existing drain to be clean. i.e. 5000 CFT in 1 Km drain.

# **B.** Allocation of fleet:

- Excavation 1 Nos.
- Tractor trolley 5 Nos.

# C. Man power:

- 5 Nos. of tractor drivers
- 1 Nos. of Excavator driver
- 2 Nos. of helpers with Excavator
- 2 Nos. of supervisors

# **D.** Fuel consumption

Depend upon the distance to be covered but normal layers such as 5 lit/trip.

20\*5=100 liters for tractor trolley

15\*6= 90 liters for Excavators

# **Procedures for Excavation:**

- Direct all of the planner's staff to reach the site on time with following arrangement
- The following PPEs must be wear by each official.

# Supervisor:

- Normal uniform of WSSC Kohat
- Safety boots with steel protection
- Safety jackets
- Safety helmets (In case of normal operational cap)

### **Drivers:**

• Uniform

- Safety boots with steel protection
- Safety helmets
- Safety jackets

#### **Helpers:**

- Uniform
- Safety boots (rubber boots are in case he may work in water)
- Wader
- Safety protection gloves
- Safety jackets
- Full water proof clothing
- Self-Control Breathing Apparatus (SCBA) in case of usage in culnets etc.

# Other safety equipment for road safety:

- Safety cones
- Signal Stick
- Road safety slogans
- Tape etc.

The work will start as per approved. Standards operating procedures (SOPs), that will ensure to the safety of the staff as the General public.

# **Completion/Ending of Activity:**

After completion of work as per approved SOPs. All of the equipment be washed with proper caution for ensuring the long term usage and durability of tools and equipment.

| Name         | Sana Fatima                |
|--------------|----------------------------|
| Designation  | Manager Municipal Services |
| Organization | WSSCM                      |

#### **Description of Activity:**

Name of work: Desilting of main drain at Mardan Bazar

#### <u>Planning:</u>

We will select a day on which traffic flow is minimum and general public entry is minimum.at Friday shops observe holidays so we will do the activity on Friday.

#### **Resources:**

HSE, Tools, vehicles, machinery, workers

#### Execution:

The drain is 4 km long, 3 ft. wide and 4 f. deep.

First of all, we provide personal protection equipment to the workers that will includes Gum Boots, Gloves, Helmets, uniform for the specialized work and worker. The sludge measured is 3 ft. in depth, 3 feet wide, and 4 Km.

Volume of sludge=4000\*0.91\*0.91

 $= 3312 m_3$ = 116963 ft<sub>3</sub>

We have 8 tractor trollies of 300 cft. each

So number of trips= 49 per day

We will need 2 excavators each of 1-ton capacity to fill the tractor trollies. As excavator will not cleaned/desilted the drain along the sides of the drain so the remaining sludge will be lifted by workers with the help of spades.

The dumping site is 5 Km away. The fuel consumption of each trolley is 5 Km/liter. No of trips are 49.

The kilometer covered will be 49\*2=490

Fuel requirement=  $\underline{490} = 98$  liters

So excavation will work for 8 hours. So fuel consumption is 14 liters/hours

=14\*8\*2=224 liters required for excavation

One blade is also required at dumping site fuel consumption of tractor blade is 8 liters/hrs.

8\*8=64 liters'/day consumption

The activity will be started at 7:00 am and will be finished at 3:00 pm.

No of workers required.

Supervisor 2 Nos at site and 1 Nos at dumping ground.

#### **Drivers:**

- 8 for tractor trollies
- 2 for Excavators
- 1 for tractor blade

I labour will also be required with tractor trolley. So number of labors with tractor trolley= 8 Nos

Number of workers require for desilting we will need 1 worker per 100 m. so the number of worker will be 40.

After cleaning the drain, the sides will be washed with water with the help of shrinking Lori that will require four sanitary workers to sweep.

Fuel consumption of sprinkling Lori is 4 liters/Km. so it will be 4\*4=16 liters

# Action Plan for operation & Maintenance of Sewerage System at Millat Chowk Sub-Division and Adjoining Areas

| Muhammad Kamran Zafar |  |
|-----------------------|--|
| Assistant Director    |  |
| P&D WASA Faisalabad   |  |

#### Area Description:

| Total area to be served     | 4 Km2      |
|-----------------------------|------------|
| Total population of area    | 12800      |
| Topography                  | Uniform    |
| Sewerage system Description |            |
| Length of sewer             | 8000 ft    |
| Total discharge             | 4.0 cusec  |
| Diameter of sewer lines     | 18"and 24" |
| Material of pipes           | RCC        |
| Number of manhole           | 80         |
| Upstream points             | 8 ft       |
| Downstream points           | 24 ft      |

#### **Tools and Material:**

- Sucker and Jetter machine
- Bamboo Cane
- Steel Rods
- Dewatering Sets
- One dumping trucks
- Traffic control equipment
- Gas Detector

#### Man power:

| Supervisor | 3  |
|------------|----|
| Sewer men  | 20 |
| Drivers    | 5  |

#### **Planning:**

- Sewerage layout plan of the area
- GIS based sewerage layout
- Three teams with equal manpower

- PPEs must be provided
- Sewer line and manhole inspection checklist must be prepared
- Inspection team will prepare preliminary inspection report and will submit report with 15 days to Sub- Divisional Offices.

Problems highlighted in meeting while discussing report.

- 1) Desilting of sewer line
- 2) Replacement of manhole cover
- 3) Blockages

#### Strategy:

Three teams will employed on sewer desilting and replacement of damaged manhole covers.

#### **Execution:**

Time period for execution = 3 months

- First of all, PPEs to the workers must be prepared allocate suitable equipment for highlighted problems.
- Traffic hazards must be availed by proper regulating the traffic
- Submit weekly report to supervisor
- Gas detection must be done before entering the manhole
- Perform the desilting and manhole cover replacement activities
- The work should be completed in three months
- After completion of the work supervisor submit the completion report
- SDO will finally give completion report after himself checking the site to higher authorities.
- After execution sucker and Jetter machine will be send to maintenance depart for its repairing and maintenance

# ACTION PLAN FOR OPERTION AND MAINTENANCE OFMILLAT CHOWK SUB-DIVISION FASIALABAD

| Salman Ahmed Hashmi |  |
|---------------------|--|
| Assistant Director  |  |
| WASA Faisalabad     |  |

#### 1. Area Description:

| Total area to be served  | 4 Km2   |
|--------------------------|---------|
| Total population of area | 12800   |
| Topography               | Uniform |

#### 2. Sewerage system Description:

| Length of sewer         | 8000 ft    |
|-------------------------|------------|
| Total discharge         | 4.0 cusec  |
| Diameter of sewer lines | 18"and 24" |
| Material of pipes       | RCC        |
| Upstream points         | 8 ft       |
| Downstream points       | 24 ft      |

#### 3. Tools and Machines:

| a) | Jetter Machine         | 01 Nos. |
|----|------------------------|---------|
| b) | Sucker Machines        | 01 Nos. |
| c) | Bamboo Canes           | 20 Nos. |
| d) | Steel rods             | 5 Nos.  |
| e) | Dewatering sets        | 1       |
| f) | Dump Trucks            | 1       |
| g) | PPEs                   |         |
| h) | Orange Cones, Flaggers |         |

#### 4. Manpower

| Supervisor | 3  |
|------------|----|
| Sewer men  | 20 |
| Drivers    | 5  |

#### **Action Plan:**

For a preventive maintenance of sewerage line, we should obtain a GIS map showing all the sewerage infrastructure detail of all the area 8000 ft line should be inspected after every 2 months. Three comprises of one supervisor and six should inspected and examine the 8000 ft pipeline. Teams should have the inspection checklist of sewer line and manhole. By inspecting the site, team should fill in the checklist carefully and supervisor will submit the checklist to sub –engineer and he will submit to Sub- Divisional Offices after counter checking the site problems. Team should examine visual, structure and hydraulic infrastructure.

Problems highlighted in the checklist should be discussed in the meeting between SDO and higher officials. Upon getting the approval to start work, three teams comprising supervisor and sewer men should be assigned duty to resolve the highlighted problem with proper strategy.

### Major problems:

- a) Blockage of sewer lines
- b) Crown failure
- c) Replacement of damaged manhole cover
- d) Repair of damaged surround

#### Time period for execution: 3 Months

#### **Execution:**

- Before starting any repair work or desilting process, provide PPEs to the workers. Allocate suitable equipment to the workers.
- Deploy proper machinery and staff according to the requirement at site.
- Avoid traffic hazard at site by using flaggers and traffic cones to maintain the traffic flow
- After opening a manhole, gas detector should be used to check for any harmful gases and if there are any harmful gases
- Perform the desilting and manhole cover replacement activity as per site requirement
- All the problem identified during inspection phase be completed within three months
- After completion of the activity, supervisor will provide report to SDO
- SDO will visit the site on and off.
- After completion of the work and report it will be submitted to higher officials
- Overall, this activity should be performed after every six months

# ACTION PLAN FOR OPERTION AND MAINTENANCE OF SEWERAGE SYSTEM (TRUNK SEWERS & MANHOLE) MILLAT CHOWK SUB-DIVISION FASIALABAD

| Samina Asif        |  |
|--------------------|--|
| Assistant Director |  |
| WASA Lahore        |  |

#### 1. Area Description:

| i.   | Total area to be served  | 4 Km2  |
|------|--------------------------|--------|
| ii.  | Total population of area | 12,800 |
| iii. | Topography               | Flat   |

#### 2. Sewerage system Description:

| i.   | Length of sewer         | 8000 ft    |
|------|-------------------------|------------|
| ii.  | Total waste water flow  | 4.0 cusec  |
| iii. | Diameter of sewer lines | 18"and 24" |
| iv.  | Number of Manhole       | 80         |
| v.   | Material of pipes       | RCC        |
| vi.  | Upstream level          | 8 ft       |
| vii. | Downstream level        | 24 ft      |

#### 3. Tools and Machines:

| i.   | Jetter Machine                                     | 01 Nos. |
|------|--|---------|
| ii.  | Sucker Machines                                    | 01 Nos. |
| iii. | Bamboo Canes                                       | 20 Nos. |
| iv.  | Steel rods   | 5 Nos.  |
| v.   | Dewatering sets                                    | 1       |
| vi.  | Dump Trucks  | 1       |
| vii. | PPEs, Flaggers, traffic Control Equipment/barriers |         |

#### 4. Manpower

| i.   | Supervisor | 3  |
|------|------------|----|
| ii.  | Sewer men  | 20 |
| iii. | Drivers    | 5  |

#### Planning: (Time line 1 Month)

Obtain a comprehensive GIS based map showing all the sewerage infrastructure in the area. Prepare a detailed checklist for sewers & Manhole Inspection. Constitute different Team should examine visual, structure and hydraulic inspection of sewerage infrastructure and handed over them the checklist.

After inspection, supervisor will submit the filled checklist along with "inspection report" to the SDO within 15 days.

After getting the "inspection report" a meeting must be held between SDO of the area and other higher officials of the Sub –Division.

Develop a proper strategy to resolve the issues highlighted/identified during field inspection.

#### Major problems:

- a) Blockage of sewer lines
- b) Crown failure
- c) Replacement of damaged manhole cover
- d) Repair of damaged surround

#### Time period for execution: 3 Months

#### **Execution:**

- First of all, provide PPEs to the workers & also proper gadgets for traffic management before commencement of ant desilting operation. Deploy proper machinery and staff according to the requirement at site.
- Deploy proper machinery & staff according to the requirement of the site.
- Supervisor must have submitted weekly report to the SDO
- Supervisor is responsible to ensure the use of PPEs, Gas Detector and all other gadgets at site.
- Perform the desilting activity and replace damaged manhole covers within the specified time
- SDO will visit the site on and off.
- After completion of the activity, supervisor will provide report to SDO
- Complete report will be submitted to higher officials of the department
- Again the final meeting will be arranged between SDO & other higher officials of the Department to receive the result of all activities.
- Thus must arranged within one month after the completion of the execution phase.

# ACTION PLAN FOR OPERTION AND MAINTENANCE OF SEWERAGE SYSTEM (TRUNK SEWERS & MANHOLE) MILLAT CHOWK SUB-DIVISION FASIALABAD

| Sana Fatima        |  |
|--------------------|--|
| Assistant Director |  |
| WASA, Lahore       |  |

#### **Project Area Description:**

| i.   | Served Area                     | 4 Km2  |
|------|---------------------------------|--------|
| ii.  | Total population of served area | 12,800 |
| iii. | Topography                      | Flat   |

#### **Description of Sewerage system:**

| Length of sewer         | 8000 ft    |
|-------------------------|------------|
| Total waste water flow  | 4.0 cusec  |
| Diameter of sewer lines | 18"and 24" |
| Number of Manhole       | 80         |
| Material of pipes       | RCC        |
| Upstream level          | 8 ft       |
| Downstream level        | 24 ft      |

#### 1. Tools and Machines:

| 1. | Jetter & Sucker Machine                            | 01 Nos. |
|----|--|---------|
| 2. | Bamboo Canes                                       | 20 Nos. |
| 3. | Steel rods   | 5 Nos.  |
| 4. | Dewatering sets                                    | 1       |
| 5. | Dump Trucks  | 1       |
| 6. | PPEs, Flaggers, traffic Control Equipment/barriers |         |

#### 2. Manpower

| i.   | Supervisor        | 3  |
|------|-------------------|----|
| ii.  | Sewer men         | 20 |
| iii. | Operators/Drivers | 5  |
| iv.  | Flag man          |    |

#### **Planning phase:**

Obtain a comprehensive GIS based map showing all the sewerage layout plan of the project area showing all infrastructure detailed in the area.

Prepare a detailed checklist relating to visual, structure and hydraulic inspection of Manhole sewer lines.

Constitute different Team for inspection purpose and handed over the checklist to the members.

At the end, supervisor will submit the inspection report to the SDO within 15 days.

After getting the "inspection report" SDO will discuss the problem with the responsible authorities (within 15 days)

Develop a proper strategy to resolve the issues highlighted/identified during inspection & testing of sewerage system of project.

#### Major problems:

- a) Blockage of sewer lines
- b) Crown failure
- c) Replacement of damaged manhole cover
- d) Repair of damaged surround

#### O&M Task:

- a) Desilting
- b) Damaged manhole cover
- c) Damaged surround

#### Time period for execution: 3 Months

#### **Execution:**

- i. Before starting the activity, provide PPEs to the workers
- ii. Allocate suitable equipment/machinery highlighted problems
- iii. Avoid traffic hazard after reaching aa site according to requirement
- iv. Gas detection test must be performed before starting work
- v. Perform desilting & manhole cover/ surround replacement as per requirement
- vi. After completion of activity, Supervisor must have submitted weekly report to Authority within 3 month
- vii. SDO will visit the site on and off during maintenance activity.
- viii. Complete report will be submitted to higher officials
- ix. Repair and maintenance should be performed as & when require
- x. Again the final meeting will be arranged between SDO & other higher officials of the Department to receive the result of all activities.

# ACTION PLAN FOR DESILTING OF SEWER LINE BEFORE MONSOON SEASON

# **Team Members:**

| Name             | Designation   | WASA   |
|------------------|---------------|--------|
| Zia Ur Rehman    | Sub- Engineer | Multan |
| M. Shakeel Ahmed | Sub- Engineer | Multan |
| Waqas Ali        | Sub- Engineer | Lahore |

# **1 <u>Planning and Execution:</u>**

#### a) Objective:

Desilting of sewer lines in different areas of different sizes, from 42" dia to 12" dia in almost six months.

#### **b)** Catchment Area:

The catchment area is 20 sq. Km with population of 30 Lac persons.

#### c) Sewer Length:

We have to clean the following sewer lines:

| Diameters | Length |
|-----------|--------|
| 42"       | 10 Km  |
| 36"       | 20 Km  |
| 24"       | 25 Km  |
| 12"to 18" | 50 Km  |

#### d) Duration:

We divided our jobs into two parts one is trunk sewer desilting and other is branch sewer desilting and we require six months to perform our complete jobs.

#### e) Labour:

We have required five teams having five members each and every team has a supervisor and a person for traffic control. Driver and helpers are also required for respective machinery which are required.

#### f) Machinery:

We require following machinery

- Sucker Machines
- Jetter Machines
- Winch Machines
- Tractor trolley
- Dumpers

#### g) Tools:

- Desilting Bucket
- Tripod with Attachment
- Steel rod
- Kassi etc.

#### h) Personal Protective Equipment:

For execution of work at site following safety equipment are required.

- 1) Breathing Apparatus
- 2) Gas Detector
- 3) Safety Vests
- 4) Horneces
- 5) Life Lines
- 6) Safety Helmets
- 7) Goggles
- 8) Safety Shoes
- 9) Emergency lights

### i) Traffic Control:

At site for safety of labour and machineries following tools are required

- 1) Diversion Board
- 2) Safety cones
- 3) Warning tapes
- 4) Traffic warden rod (light)

# 2 **Execution:**

### A. Desilting of Trunk Sewer:

### 1) Length:

The trunk sewer having length 42" dia sewer line is 10 Km and 36" dia has 20 Km. So, total length of trunk sewer for Desilting purpose is 30 Km.

#### 2) Time for Execution:

The sewer line of 30 Km can be desilted in 2.5 months.

#### 3) Team Required:

We have five teams and each and every team has a supervisor and five sewer men and a person for traffic control.

#### 4) Machinery:

One number of pick up for transportation and a dumper for sludge carrying purpose.

#### **B.** Branch Sewer Line

#### 1) Length:

| Diameter     | Length |
|--------------|--------|
| 24"          | 25 Km  |
| 12"-18"      | 50 Km  |
| Total length | 75 Km  |

#### 2) Time for Execution:

Three months required for execution the job.

#### 3) Team Required:

We have same team (5) as in trunk sewer.

#### 4) Machineries:

- Winch machine
- Sucker Machine
- Jetter Machine

In a week total 7.5 Km sewer line is desilting by all team.

#### 5) **Re-Desilting:**

Trunk sewer line is desilted of desilting is completed and system is ready for Monsoon.

#### 3 <u>Inspection:</u>

#### a) Daily Inspection:

Daily inspection is done by supervisor with the help of performance, pictures and videos.

#### b) Weekly & Monthly Inspection:

Such inspection is done by Sub-Engineer and Assistant Director inspect site visually and collected data submitted by supervisor.

#### c) Final Inspection:

Final inspection is done by deputy Director and Director works, visually and collected data submitted by Sub- Engineer and Assistant Director and finally report is submitted to Managing Director.

# **ACTION PLAN OF ZONE-B, WSSP**

#### **Team Members:**

| 1 | Ahmed Khalil | 2 | Khalid Bin Rasheed |
|---|--------------|---|--------------------|
| 3 | Naeem Ahmed  | 4 | Zafar Ullah        |

# 1 <u>Task:</u>

Preparation of Operation and Maintenance (O&M) Action Plan of Sewerage System of the Zone-B, Peshawar which consist of 21 unions councils of Peshawar City.

# 2 Current Status:

| a) Length of the Sewer        | 60 Km  |
|-------------------------------|--|
| b) Type of the Sewer material | R.C.C.   |
| c) Diameter of the Sewer pipe | 9" to 3'   |
| d) Resource available         | <ul> <li>Jetter &amp; Sucker Machine</li> <li>Steel Rods</li> <li>Bamboo Rods</li> <li>PPEs</li> <li>Barricades tools</li> </ul> |
| e) Staff available            | <ul> <li>Chief supervisor</li> <li>Supervisor</li> <li>Sewer Men</li> <li>Drivers</li> <li>Helpers</li> </ul>                    |

# 3 Planning & Scheduling:

As Zone –B consist of 21 UCs having Sewer pipe of different diameters 9" to 3'. The steps will be followed before the start of execution.

#### a) Composition of Groups:

Different groups of supervisors, sewer men will be created for cleaning of sewer lines at different location for effective cleaning activities.

#### b) Fleet Management:

A team of supervisors, helpers and drivers will be deployed to keep the vehicles in running condition and will be utilized on demand from the supervisor of different groups.

#### c) Tools:

The following different tools will be utilized by the groups:

- Steel rods
- Bamboo Stick
- PPEs
- Traffic control Supervisors

#### d) Schedule:

A timeline will be provided to the supervisors for effective utilization of resources and staff.

# 4 Executive Plan:

During execution, the following steps will be followed:

#### a) SOPs:

The SOPs developed will be followed during execution.

| Sr.<br>No. | Location | Tasks          | Resources         | Time        | Assigned To |  |
|------------|----------|----------------|-------------------|-------------|-------------|--|
| 1          | Gulbahar | Sewer Cleaning | • Staff           | No. of days | Supervisors |  |
|            |          |                | • Jetter & Sucker |             |             |  |
|            |          |                | Steel Rods        |             |             |  |

#### b) Timeline:

The supervisor will work hardtop achieve the timeline provided which is assumed a 3 days for cleaning 1 Km length of Sewer.

#### c) Team Role:

The following personnel has assigned for the execution of work:

| Chief Supervisor | Will supervise overall condition                           |
|------------------|--|
| Supervisor       | Will be responsible for the group activities               |
| Drivers          | Will be responsible to keep the vehicles in good condition |
| Helpers          | Will assist the driver                                     |

#### d) Execution of work:

The Following different steps will be followed during execution of work:

#### i. Barricade of Area:

Before the start of work, the area must be barricaded to avoid of accidents.

#### ii. Traffic Control:

The members of groups will be deployed to control traffic in working place.

## iii. Machinery Usage:

Machinery will be deployed as per SOPs.

# iv. Safety Control:

Supervisor will check all the safety tools (PPEs) provided to the Sewer men and ensure its usage.

# v. Checking the Area:

The area ( ) the manhole before the start of work to avoid any dangerous.

# 5 Data Collection and Record:

The Supervisor will keep the record of the resources assigned and check the work executed as per approved checklist.

# • Verification:

The data provided by the supervisors will checked by the supervised. The data handed over to the Assistant Manager before verification by the chief supervisor. He assistant Manager will analyze the data and access the progress, defects, incidents occurred and recommended. The deficiency arises during the work to the higher-ups for the remedial measures.

| Sr.<br>No. | What To<br>Do                               | How To Do  | When To<br>Do  | Who To Do<br>By) | (Carried out                              | Do with What                         |  | Check<br>Done<br>(How To<br>check) | Who to<br>Check<br>(To Be<br>Checked By) |
|------------|---|--|--|------------------|---|--------------------------------------|--|------------------------------------|--|
|            | Define O&M<br>Task                          | Followed SOPs  | (Frequency)  | Class of work    | Workers                                   | Material                             | Tools/<br>Equipment  |                                    |  |
| 1          | Sewerage<br>System<br>Cleaning<br>operation | Followed<br>approved SOPs<br>mentioned in<br>Action Plan | Preventive<br>Operation,<br>Regularly<br>cleaning of<br>Sewer<br>System,<br>Emergency<br>(plans &<br>SOPs) | Supervisors      | Drivers,<br>Helpers,<br>Drain<br>Cleaners | PPEs, Sign<br>Board,<br>Bamboo Stick | Sucking &<br>Jetting<br>machine,<br>Cleaning<br>Rods,<br>Bamboo<br>Stick | Inspection ,<br>Record<br>keeping  | Concern<br>Supervisor,<br>AM/AD etc.     |