



RAND WATER

SHE Baseline Risk Assessment for Projects

Form: SAM SHE 00304F

Template Rev: 02

Date: February 2018

Project Site:	Panfontein
Project Description:	Construction of the stockpile area and rehabilitation of drying beds at Rand water Panfontein Station
System	Primary
Specification No.	SHER 27.11.20
Risk Register Rev.No.	1
Date Compiled/revised:	20/11/2020
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Tolerable risk
Medium risk
High risk

Risk no.	Department / Location	Activity	Hazards/ Aspects	Risks/ Impacts	Risk Context	Impact		Exposure		Likelihood		Inherent Risk	Existing Controls - Elimination, Substitution, Engineering Controls, Administration Controls	Control Effectiveness		Residual Risk Exposure	Identify Opportunities from process or activities / Further mitigation			
					Risk Category	Rating	Basis Points	Rating	Factor	Rating	Basis Points	Basis Points		Rating	Factor	Factor	Description	Action Owner	Due Date	Update
1	Raw Water / Panfontein Site Camp	Access Control	Contact with moving vehicles, Struck by moving plant or machinery/Use of guns/violence	Bodily injuries, property damage, theft	Safety	Major	50	Medium	0.60	Likely	0.59	18	Rand Water Security available at the Main Gate and Truck Gate. Contractor to provide Security at site camp. Induction. Keeping of firearms in a safe. Signage.	Satisfactory	0.35	6	N/A	N/A	N/A	N/A
2	Raw Water / Panfontein Project Site	Protection of assets and equipment: Existing Services and Site Camp Facilities	Employees, third parties	Theft, loss	Safety	High	25	High	0.80	Likely	0.59	12	Securing of assets, competent security personnel (PSIRA registered), existing contractor site camp facilities and services, be cautious when working near Rand Water assets with machinery	Satisfactory	0.35	4	N/A	N/A	N/A	N/A
3	Raw Water / Panfontein Site Camp & Project Site	Driving on site	Speeding, uneven roads, adverse weather conditions, incompetent personnel, faulty vehicles, medically unfit, unauthorised vehicles on site, fatigue	Accidents, fatality, financial claims, environmental contamination, property damage, injuries	Health & Safety	Major	50	Medium	0.60	Likely	0.59	18	Speed limit is 20km/h on site, one way roads will be demarcated for the project (drawing RO27538_03) , traffic management plan, awareness, road maintenance, vehicle road worthiness, medical fitness records, PDP's, controlled access, regular breaks, inductions	Satisfactory	0.35	6	N/A	N/A	N/A	N/A
4	Raw Water / Panfontein Site Camp	Site establishment	Site identification, clearing area and ground, under ground services not detected, site layout plan, fence erection, loading and off loading, noise and dust, poor housekeeping, inadequate stacking and storage, temporary electrical installations	Underground services damaged, electrocution, flooding, gas leaks, property damage, third party claims, environmental impacts,	Safety	Major	50	Very High	1.00	Very Likely	0.82	41	Site security. Induction. Keeping of firearms in a safe. Signage, inspections and monitoring, legal appointment letters, procedures, electrical certificate of compliance, existing services are available. Electrical Certificate of Compliance	Satisfactory	0.35	14	N/A	N/A	N/A	N/A

5	Raw Water / Panfontein Site Camp & Project Site	Welfare Facilities	Inadequate ablution/eating/showering facilities	Poor health and hygiene, infections, illnesses and diseases	Environmental	Major	50	Medium	0.60	Very Likely	0.82	25	Septic tank available, provision of temporary ablution and dining facilities and consultation with employees for requirement of showering facilities.	Satisfactory	0.35	9	N/A	N/A	N/A	N/A
6	Raw Water / Panfontein Project Site	Clearing and grubbing at Project Site	Existing services, equipment, insects and animals, noise and dust,	Fauna and flora impact, electrocution, leaks, property damage, injury, fatality	Health	Major	50	Medium	0.60	Likely	0.59	18	supervision, procedures, checklists, operator competency, plans, wayleaves and authorisations, medical certificates, legal appointments, machinery maintenance records, spill kits and trip trays	Satisfactory	0.35	6	N/A	N/A	N/A	N/A
7	Raw Water / Panfontein Project Site	Setting up sites	Hand tools, dust, poor housekeeping around dam areas	Property damage, defective tools, incorrect setting up of site, injuries	Health & Safety	Major	50	Medium	0.60	Very Likely	0.82	25	supervision, procedures, checklists, operator competency, plans, wayleaves and authorisations, medical certificates, legal appointments, machinery maintenance records, calibration certificates,	Satisfactory	0.35	9	N/A	N/A	N/A	N/A
8	Raw Water / Panfontein Project Site	Placement of key project team personnel on site	Incompetent Construction Manager/Supervisor/s/Safety Officer appointed. Construction Safety Officer appointed on a part time basis, Unregistered Construction Safety Officer.	Legal non-compliance, poor supervision of employees, injuries, fatalities	Health & Safety	Major	50	High	0.80	Likely	0.59	24	submission of SHE file for approval prior to site establishment. SHE file contains competencies of key personnel	Satisfactory	0.35	8	N/A	N/A	N/A	N/A
9	Raw Water / Panfontein Project Site	Emergency Preparedness/respnose	Inadequate emergency procedure, failure to communicate to employees, inadequate signage, poor coordination, emergency threats, inadequate warning systems,	Injuries, fatalities, production losses, property damage, financial losses,	Safety	High	25	High	0.80	Very Likely	0.82	16	procedures, emergency alarms, legal appointments, emergency contact list, awareness, PPE, fire drills, disaster management plan, contractors to have a site specific emergency plan. Site Emergency Preparedness Plan QMS 00508F Rev 1	Satisfactory	0.35	6	N/A	N/A	N/A	N/A
10	Raw Water / Panfontein Project Site	Working at extreme and adverse conditions	Exposure extreme temperatures,	sun burns, heat stroke, skin cancer, hypothermia, dehydration, fatality	Safety	Major	50	High	0.80	Likely	0.59	24	Awareness, sunscreen, PPE, Procedures, certificate of fitness, proper scheduling of work according to the season	Satisfactory	0.35	8	N/A	N/A	N/A	N/A
11	Raw Water / Panfontein Project Site	Working in the veld	Snakes (rinkles & puffadders are common), bees, wasps	Insects/ snakes bites, injuries, fatalities	Safety	High	25	High	0.80	Likely	0.59	12	Training and awareness, PPE,	Satisfactory	0.35	4	N/A	N/A	N/A	N/A
12	Raw Water / Panfontein Project Site	Working with petrol, diesel, concrete	Inhalation, indigestion, congestion, spillages	Slippery,Injuries, fatalities, disorientation, dizziness, vomiting, nausea	Safety	Major	50	Medium	0.60	Very Likely	0.82	25	Bunded area to contain spillages. Permits are required should capacity of flammable substances stored on site exceed 1000lt, Training and awareness, emergency procedure, PPE, alarms, MSDS, windsocks	Satisfactory	0.35	9	N/A	N/A	N/A	N/A

13	Raw Water / Panfontein Project Site	Exposure to various specified products containing hazardous chemical substances.	Hazardous chemicals as per HCSR	Infection to worker's respiratory system, Inhalation of toxic chemicals, Fire, Explosion, excessive occupational exposure levels.	Safety	High	25	High	0.80	Likely	0.59	12	Training, MSDS-availability and adherence, Correct storage, Correct disposal, RequiredPPE.	Satisfactory	0.35	4	N/A	N/A	N/A	N/A
14	Raw Water / Panfontein Project Site	Natural disasters	Flooding, earth tremors	Delays in work, injuries, drowning, fatalities, property damage, soil pollution	Safety	Minor	6	Low	0.40	Unlikely	0.42	1	Insurances, training and awareness, alternate road available	Satisfactory	0.35	0	N/A	N/A	N/A	N/A
15	Raw Water / Panfontein Project Site	Riots/strike	Employees, third parties	Delays in work, injuries	Safety	High	25	Medium	0.60	Likely	0.59	9	Training and awareness, Insurances such as social agreement contract, stakeholder meetings	Satisfactory	0.35	3	N/A	N/A	N/A	N/A
16	Raw Water / Panfontein Project Site	Power interruptions	Machinery going off,	Delays in project completion, unexpected shutting and starting of machinery	Safety	High	25	Low	0.40	Unlikely	0.42	4	Back up generators, People to stay clear from electrical machinery/equipment	Satisfactory	0.35	1	N/A	N/A	N/A	N/A
17	Raw Water / Panfontein Project Site	Emergency Overtime Work	Long working hours, inadequate emergency coordination, incompetent personnel	Injuries, fatalities, property damage, theft, fatigue	Safety	High	25	Medium	0.60	Likely	0.59	9	after hours forms, procedure, awareness, adequate breaks or time off work, night work is prohibited	Satisfactory	0.35	3	N/A	N/A	N/A	N/A
18	Raw Water / Panfontein Project Site	Pedestrian traffic during and after works.	No safe roadway for pedestrians	Injuries, fatalities	Safety	Major	50	Medium	0.60	Likely	0.59	18	Provide temporary safe means during construction to ensure segregation of vehicles and pedestrians, limit manpower/labour on site, high visibility vests to be worn, designated walkways, hosts to accompany visitors, one way roads for construction vehicles	Satisfactory	0.35	6	N/A	N/A	N/A	N/A
19	Raw Water / Panfontein Project Site	Working with mobile plant and Equipment /cranes	Speeding, uneven roads, adverse weather conditions, incompetent personnel, faulty mobile plant, medically unfit personnel, unauthorised mobile plant on site, fatigue, inadequate	Accidents, fatality, financial claims, environmental contamination, property damage, injuries	Safety	Major	50	Very High	1.00	Very Likely	0.82	41	Traffic management plan, awareness, maintenance records, vehicle road worthiness, medical fitness records, controlled access, regular breaks, inductions, load test certificates, operator licences, industrial skills cards, legal appointments, checklists, procedures, drip trays	Satisfactory	0.35	14	N/A	N/A	N/A	N/A
20	Raw Water / Panfontein Project Site	Working close to drying beds	Falling into drying bed, biological hazards	Fatalities, injuries, sicknesses, diseases	Safety	Major	50	High	0.80	Likely	0.59	24	Awareness, PPE, Procedure and inspections, medical surveillance	Satisfactory	0.35	8	N/A	N/A	N/A	N/A
21	Raw Water / Panfontein Project Site	Working near sludge dams (under operations)	Dams at full capacity	Drowning, property damage, soil pollution	Safety	Major	50	High	0.80	Very Likely	0.82	33	Follow project programme, Site emergency plan, Site monitoring by operations personnel, Contractor site emergency plan	Satisfactory	0.35	11	N/A	N/A	N/A	N/A
22	Raw Water / Panfontein Project Site	Sludge Handling	Hazardous and non-hazardous waste, contact with skin	Ground pollution, water pollution, poor housekeeping, Dermatitis	Safety	Major	50	High	0.80	Very Likely	0.82	33	Waste management plan and pollution prevention programmes. Sludge is filled to a height of 2.5m. Waste shall be disposed to registered waste sites. Housekeeping inspections.	Satisfactory	0.35	11	N/A	N/A	N/A	N/A
23	Raw Water / Panfontein Project Site	Gas and electrical welding and cutting	Gas, Fire, sparks	Fire or explosion, electrocution, respiratory infections/diseases	Safety	Major	50	High	0.80	Likely	0.59	24	Use work permits, proper storage	Satisfactory	0.35	8	N/A	N/A	N/A	N/A
24	Raw Water / Panfontein Project Site	Working at Heights	Falling objects, equipment	Injuries to workers, damage to equipment	Safety	Major	50	High	0.80	Likely	0.59	24	Training for working at heights, Fall protection plan.	Satisfactory	0.35	8	N/A	N/A	N/A	N/A
25	Raw Water / Panfontein Project Site	Work on scaffolds and ladders	Openings in the floor boards, waste not removed on the floor boards,	Property and equipment damage, body harm and time delays	Safety	Major	50	High	0.80	Likely	0.59	24	Training and appointment of scaffold inspector, no unauthorized modification of the scaffold, safe/use of unsafe tags and work permit for working at heights	Satisfactory	0.35	8	N/A	N/A	N/A	N/A
26	Raw Water / Panfontein Project Site	Compacting Bedding	Moving machinery, noise, vibration, dust, unstable side walls, inadequate compaction of material, use of troxler machine, inclement weather	Side walls collapsing, injuries, NIHL, white finger and whole body vibration syndrome, radiation exposure	Safety	High	25	Very High	1.00	Very Likely	0.82	21	supervision, procedures and checklists, inspection and testing of G3 and drying bed wall integrity, operator competency, plans, medical certificates, legal appointments, machinery maintenance records	Satisfactory	0.35	7	N/A	N/A	N/A	N/A

27	Raw Water / Panfontein Project Site	Environmental rehabilitation done by Environmental Management Services	Equipment & machinery, handtools, use of ladders, abnormal activities and emergencies, storm water drainage, paving, seedings, lawn planting, hazardous chemicals and	Injuries, fatality, property damage, environmental spillage, landslides, soil erosion	Safety	High	25	High	0.80	Unlikely	0.42	8	EMP, Site environmental authorisation, HD Liners on drying bed walls and floors	Satisfactory	0.35	3	N/A	N/A	N/A	N/A
28	Raw Water / Panfontein Project Site	Removal, transportation and disposal of vegetation	Moving equipment and machinery, loading and off loading, noise and dust, poor housekeeping, inadequate stacking and storage, insects and reptiles	Fauna and flora impact, leaks, property damage, injury, fatality, respiratory diseases	Safety	Major	50	Medium	0.60	Likely	0.59	18	supervision, procedures, checklists, operator competency, plans, medical certificates, legal appointments, machinery maintenance records, spill kits and drip trays, designated area for vegetation to be dumped, no disposal of vegetation outside Rand Water premises	Satisfactory	0.35	6	N/A	N/A	N/A	N/A
29	Raw Water / Panfontein Project Site	De-establishment of site	Site clearing, removal of site camp, containers, fencing, temporary road signs. Removal of key staff during decommissioning.	Injuries, fatalities, reduction in legal compliance,	Safety	Moderate	13	High	0.80	Very Likely	0.82	9	Risk Assessments and Method Statements. No key employees to be removed including site agent, and H&S Officer. Ensure coverage available for defect liability period.	Satisfactory	0.35	3	N/A	N/A	N/A	N/A
30	Raw Water / Panfontein Project Site	Hand Over of Site	Valves failing under pressure test, use of generators and pumps	Injuries, fatalities, noise, fumes, loss of water	Safety	High	25	High	0.80	Likely	0.59	12	Competent person/company to be used for pressure testing, induction training, PPE	Satisfactory	0.35	4	N/A	N/A	N/A	N/A
31	Raw Water / Panfontein Project Site	Covid-19 management and prevention	SARS CoV 2 on surfaces (tables, chairs, paper etc) & COVID-19 infected persons	Health effects, local transmission of COVID-19	Health	Major	50	High	0.80	Very Likely	0.82	33	RW Specification & BOQ regarding the management of Covid-19 on site; Contractor Covid- Management Plan & Risk Assessment for approval before commencement; Screening of employees; PPE; social distancing measures; Client induction; Awareness on Covid;	Good	0.20	7	N/A	N/A	N/A	N/A

Factors used in Key Risk Analysis

Each risk is evaluated in terms of potential loss, likelihood of occurrence and the effectiveness of controls in place to manage the risks according to the criteria set out below

IMPACT SCALE							
	Level	Outcome description (Business Risk)	Impact Values(Basis points)	Safety	Health	Environment	Quality
1	Extreme	Extreme event with the potential to lead to collapse of business and is fundamental to the achievement of objectives. Non achievement of Rand Water mandate	100	Multiple Fatalities , Very serious irrevesable injury from 10 people and above	May cause multiple deaths	Transboundary/National environmental disaster with long term or irreversible ecological impacts with high risk of legal and public liability.	Total system failure
2	Major	Major event which can be endured but which may have a prolonged negative impact and extensive consequences.	50	Fatality, Multiple Major injuries or disability, Significant irreversable injuries to up to 10 people	Life threatening affects	National environmental disaster with long term ecological impacts with high risk of legal and public liability.	Repeat non-conformance

3	High	High impact events, which can be managed but requires additional resources and management effort.	25	Single major injury or disabling reportable	Irreversible significant health effects	Event that leads to environmental contamination (failure to manage appropriately, but contained within Rand Water boundaries)	Needs immediate corrective action within 2 weeks
4	Moderate	Event which can be managed under normal operating conditions.	13	Minor injuries, lost time,	Reversible significant health effects	Event which can be contained. Is limited to immediate area of occurrence associated with short term ecological disturbances, and/or is a transgression of internal standard	Needs immediate corrective action within 1 month
5	Minor	Events of which consequences can readily be absorbed under normal operating conditions.	6	Minor injuries, no lost time	Reversible minor health effects	Minor negative impact, no corrective action necessary. Must be monitored.	Corrective action not required but monitored
6	Insignificant	Frequent minor risks that do not disrupt business, or with no adverse health effect or injuries.	3	No Health effects	Negligible	Negligible	Does not require corrective action

QUALITATIVE ASSESSMENT OF PROBABILITY/ LIKELIHOOD OF OCCURRENCE		
Likelihood/ Probability rating	Description	Percentage
Almost certain	The event is expected to occur in most circumstances	100%
Very likely	The event will probably occur in most circumstances	67% -96%
Likely	The event should occur at sometime	51% -66%
Unlikely	The event could occur at sometime	34% -50%
Very unlikely	The event may occur only in exceptional circumstance.	2% - 33%
Almost impossible	The event may never occur	1%

QUALITATIVE ASSESSMENT OF CONTROLS		
Level	Description	Factor
Very good	Controls are totally effective, efficient and implemented.	81% - 99%
Good	Most risks are effectively controlled and mitigated	66% - 80%
Satisfactory	There is room for some improvement in	41% - 65%
Weak	Some risks appear to be controlled but	21%-40%
Unsatisfactory	The control system is ineffective	<20%

RATING MATRIX					
1%	2% to 33%	34% to 50%	51% to 66%	67% to 96%	97% to 100%

		Almost Impossible	Very Unlikely	Unlikely	Likely	Very Likely	Almost Certain
	Basis Points	1%	18%	42%	59%	82%	100%
Extreme	100	1.0	17.5	42.0	58.5	81.5	100.0
Major	50	0.5	8.8	21.0	29.3	40.8	50.0
High	25	0.3	4.4	10.5	14.6	20.4	25.0
Moderate	13	0.1	2.3	5.5	7.6	10.6	13.0
Minor	6	0.1	1.1	2.5	3.5	4.9	6.0
Insignificant	3	0.0	0.5	1.3	1.8	2.4	3.0

Exposure							
Factor	Rating	Prescribed legal limits (PLL)**	Frequency	Duration	Extent	Environment	Quality
1.00	Very high	>200%	2 X per Shift	<40Hrs	over 101m	Extensive	Extensive
0.80	High	101%-200%	1 X per Shift	<8hrs>40Hrs	51-100m	Widespread	Widespread
0.60	Medium	75%-100%	Weekly	<2hrs>8 Hrs	11-50m	Significant	Significant
0.40	Low	50%-75%	Monthly	<1Hrs>2Hrs	6-10m	Restricted	Restricted
0.20	Insignificant	< 50%	Annually	> 1 hr	1-5m	Negligible	Negligible

Colour Code	Detail	Basis Point Range
	Tolerable risk	0 to 3
	Medium risk	3.1 to 24.9
	High risk	25 to 100