



AzSPU Procedure for Management of Naturally Occurring Radioactive Material (NORM)

AzSPU-HSSE-DOC-00097-2

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1 Purpose/Scope

This procedure provides instructions for work involving Naturally Occurring Radioactive Material (NORM) to ensure that it is carried out safely, and in accordance with applicable legislation and standards.

This procedure applies to all work involving NORM carried out by, or on behalf of, the Azerbaijan Strategic Performance Unit (AzSPU).

Revision of this procedure and the operational controls detailed therein will be in accordance with the AzSPU HSSE Document Management Procedure ([AzSPU-HSSE-DOC-00025-2](#)).

2 Definitions

Refer to document AzSPU HSSE Definitions [AzSPU-HSSE-DOC-00021-2](#) for definitions common to this HSSE&S MS.

Definitions specific to radiation management are included in Appendix A of the AzSPU Procedure for Management of Radioactive Materials & Radiation Generators ([AzSPU-HSSE-DOC-00058-2](#)).

3 General Requirements

General requirements pertaining to radiation safety are detailed in Section 3.1 of the AzSPU Procedure for Management of Radioactive Materials and Radiation Generators ([AzSPU-HSSE-DOC-00058-2](#)).

Radioactive Material Exemptions

Under Safety Series 115 – International Basic Safety Standards for Protection against Ionising Radiation and for the Safety of Radiation Sources (IAEA, 1996) sources within practices are automatically Exempted if they do not exceed specified Exemption levels of total activity or activity concentration. For NORM containing radium-226 and radium-228, the Exemption level for each is 10 Bq/g.

NB: Exempt material is nonetheless radioactive and should be treated as such. In addition, there may be other properties of the waste that restrict the disposal options such as oil content.

Radioactive Waste

Radioactive waste is any scrap material, effluent, or unwanted surplus material that has been identified as radioactive, in accordance with the definitions above.

In terms of contaminated equipment, this can only be classed as radioactive waste if it is to be scrapped. If equipment is being cleaned (either offshore or onshore) and then re-used it is not classed as waste. If equipment has to be cleaned before the decision is made to scrap, then it is also not classed as waste.

Licences

In accordance with the Decree of the President of the Azerbaijan Republic on “Additional Measures in the Area of Issuing Special Permits (Licences) for Certain Types of Activity”,

No. 510 (29.12.2006), a 'special permission' is required for the storage and disposal of radioactive and ionising waste, which is issued by the MENR.

Any AzSPU operated site that requires a 'special permission' should discuss this with the AzSPU Radiation Protection SPA.

4 Key Responsibilities

A full description of the responsibilities with regard to radiation protection is provided in Section 4 of the AzSPU Procedure for Management of Radioactive Materials and Radiation Generators ([AzSPU-HSSE-DOC-00058-2](#)). A summary of key responsibilities directly applicable to this procedure are provided below:

Site Radiation Protection Supervisor (RPS)

The site RPS is responsible for the following:

- Conducting contamination checks of equipment (using monitors).
- Establishing supervised / controlled areas, where required.
- Collecting NORM samples (where required) and arranging for them to be couriered to the Tracerco laboratory.
- Maintaining generic risk assessments for work with NORM contaminated equipment / waste and providing input to task specific risk assessments.
- Carrying out on-site NORM hazard and control training, and ensuring persons working with NORM are aware of, and understand this procedure.
- Managing the storage, handling and labelling of NORM contaminated material and doing a weekly inventory and review of storage arrangements.
- Maintaining Site Radiation Records (NORM Contamination Monitoring Log, NORM Survey Report, NORM Sample Register, NORM Waste Accumulation and Storage Record, training records, etc).
- Notifying the AzSPU RP SPA if NORM waste is to be stored on site, so that a 'Special Permission' can be obtained.

AzSPU Radiation Protection Single Point Accountability (AzSPU RP SPA)

Responsible for:

- Maintaining a proper communication flow between the AzSPU Radiation Protection Advisor (UK based) and the Site Radiation Protection Supervisors (RPSs).
- Liaising with MENR in order to obtain a 'Special Permission' if NORM waste storage is to be carried out on an AzSPU site.

AzSPU Radiation Protection Advisor (RPA)

AzSPU retains by contract and appointment a RPA to provide the AzSPU with expert advice on radiation safety and compliance matters. The RPA reports to the AzSPU Safety & Compliance Manager and works directly with the AzSPU RP SPA.

In terms of this procedure, the RPA will provide guidance on the following:

- Sample analysis results interpretation.
- Advice on transportation requirements and disposal route options (based on results of sample analysis).

OIM / Site Manager

Accountable for ensuring that any NORM contaminated waste is transferred from site as soon as reasonably practicable (in consultation with the site RPS).

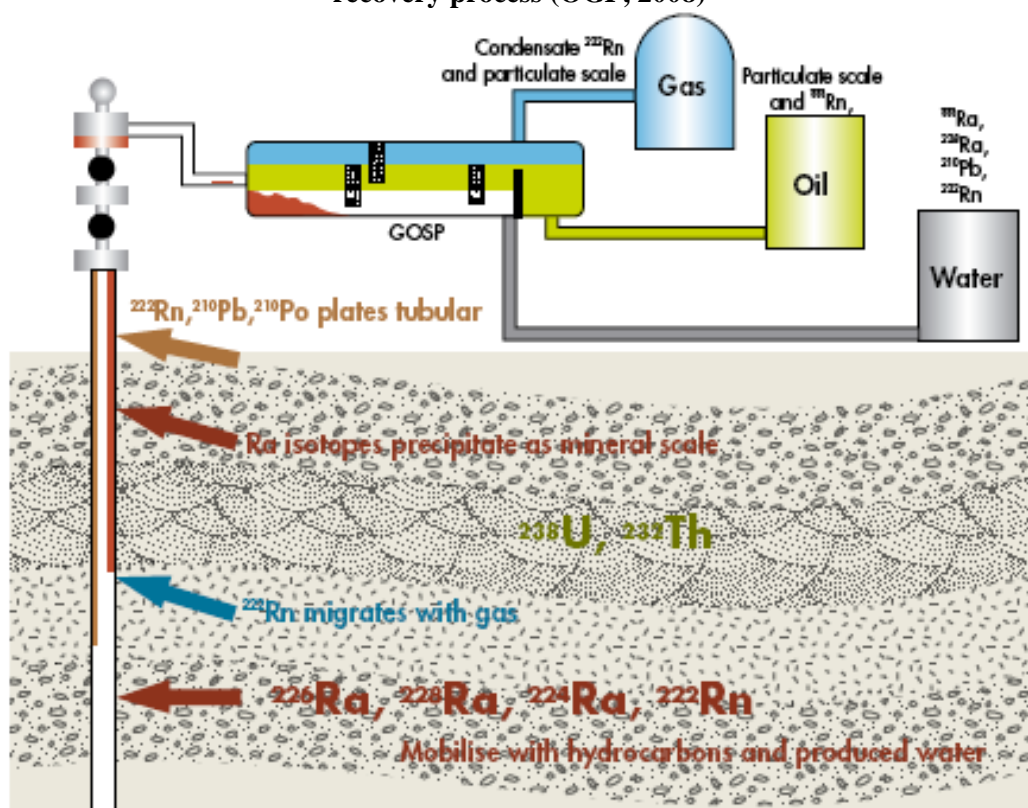
5 Procedure

5.1 NORM Overview

Naturally occurring radionuclides are present at varying concentrations in the earth's crust and can be concentrated and enhanced by processes associated with the recovery of oil and gas. This 'enhanced' NORM, often known as TENORM (Technologically Enhanced Naturally Occurring Radioactive Material) can be created when industry activity increases the concentrations of radioactive materials, or when the material is redistributed as a result of human intervention or some industrial processes.

During the production process, NORM flows with the oil, gas and water mixture and accumulates in scale, sludge and scrapings. It can also form a thin layer of film on the interior surfaces of gas processing equipment and vessels (see Figure 1). The level of NORM accumulation can vary substantially from one facility to another depending on the geological formation, operational factors, and other variables. To determine whether or not a facility has NORM contamination, NORM survey, sampling and analysis needs to be conducted.

Figure 1: The Origins of NORM, indicating where NORM may accumulate in the recovery process (OGP, 2008)



The NORM nuclides of primary concern in oil production are Radium-226 and Radium-228. These decay into various radioactive progeny, before becoming stable lead.

Other radionuclides such as Lead-210 and Polonium-210 can also be found in pipeline scrapings as well as sludge accumulating in tank bottoms, separators, tanks and waste pits.

Radon-222 is a radioactive gas, which is present in varying degrees in natural gas in oil & gas formations. In the absence of natural gas, radon dissolves in the (light) hydrocarbon and aqueous phase. When produced with the oil and gas, radon will usually follow the gas stream.

5.2 Monitoring for NORM

Due to the fact that NORM can occur in numerous locations, it is important to test all equipment which has been in contact with fluids of any sort for NORM contamination before work commences. This applies to work involving maintaining, repairing or exposing internal surfaces of the oil and produced water process (vessel entry, pipework systems, tubulars, etc). It also applies to seawater systems, as seawater contains trace levels of Lead-210 and Uranium-238, which can be deposited as a radioactive film when large quantities of seawater pass through any plant or equipment. Pipeline pigs and debris from pigging operations should also be routinely checked for NORM contamination.

The presence of NORM within well and process equipment is identified by the use of site contamination monitors. Contamination checks are only carried out by the site RPS, or by an Authorised Monitor User (i.e. someone who has received appropriate training).

Guidance on the proper use of radiation monitoring instruments and the correct interpretation of results, is provided in Appendix F of the AzSPU Procedure for Management of Radioactive Materials & Radiation Generators ([AzSPU-HSSE-DOC-00058-2](#)). Specific information on the method for conducting contamination monitoring of tubulars is provided in Appendix A.

The site RPS, or Authorised Monitor User, will consider a “sustainable rise above background” as a sign of contamination when monitoring items or material.

The NORM Contamination Monitoring Log (Appendix B) must be completed each time a check is made, even if the result is negative.

If a positive result is found then a NORM Survey Report (Appendix C) must be completed and the report given a unique reference number.

If the contaminated material / equipment is to be disposed of, the site RPS will then collect samples (in accordance with Appendix D) and ensure that they are sent to a specialist laboratory for analysis, i.e. the Tracerco laboratory in Billingham (contact details provided in Appendix B of the AzSPU Procedure for Management of Radioactive Materials & Radiation Generators ([AzSPU-HSSE-DOC-00058-2](#))). Details of the samples will be recorded in the NORM Sample Register (Appendix E).

The RPA will use the analysis results to determine whether the material is Exempt or not (see Section 3) and will advise the site RPS accordingly (through the AzSPU RP SPA). A record of the weight of material, together with the analysis results, will be used to record the actual activity of the material that is to be disposed of.

5.3 Preparation for Work Involving NORM

5.3.1 Risk Assessment

A generic risk assessment for work with NORM will be maintained by the RPS in the Site Radiation Records. Task or job specific risk assessments will also be carried out, using the generic risk assessment as a basis.

5.3.2 Training

All persons involved in work with NORM must have received radiation awareness training. Normally this will involve a one day NORM Awareness Training Course, however, the RPS may carry out on-site training provided this covers the hazards and risks associated with exposure to NORM and the control measures to keep exposures as low as reasonably practicable. In addition, the Site RPS will ensure that all persons working with NORM are aware of and understand the relevant parts of this procedure.

The RPS will ensure that records of all training are kept in the Site Radiation Records.

5.3.3 NORM Handling Materials

All sites must have a stock of basic NORM handling materials, namely NORM tape, polythene sheeting and sample pots. If well work is being carried out (which involves pulling tubing) then sufficient end caps and polythene sleeves must also be available.

5.3.4 Personal Protective Equipment

There are two ways in which personnel can be exposed to NORM, namely:

- External exposure - where the radioactive material remains outside the body.
- Internal exposure - where radioactive material is taken into the body via inhalation, ingestion or absorption.

All persons carrying out work where NORM may be present must wear the following PPE as a minimum:

- Impervious overalls that can be easily decontaminated e.g. one-piece slicker suits.
- Impervious boots and gloves.
- A filtering face piece respirator with P3 filter for work with small quantities in Supervised Areas. Or a 'face fitted' respirator to EN149FFP – P3 rated as minimum (e.g. 3M 8835, Moldex 3405 or Draeger Piccola FFP3-V type) for work in Controlled Areas. All respirators must be 'CE' marked and consideration must also be given to the presence of other hazards that may require a COSHH assessment to be carried out. For 'heavy work', or work in areas where other hazards exist, it may be appropriate to use air-fed breathing apparatus.
- Eye protection goggles.

All open wounds must be dressed with water proof dressings prior to any work with NORM.

No smoking, eating, drinking, chewing of gum, sweets or tobacco or application of barrier cream, e.g. lip salve, is permitted by any individual whilst engaged in any operation where NORM scale is being handled.

Any individual involved in a NORM operation must decontaminate himself prior to leaving the worksite by wiping down or showering/hosing with water, with particular attention being paid to boots and gloves. Personnel must be monitored by the site RPS to confirm that the decontamination procedure has been effective.

Personal protective equipment may be kept for reuse provided it has been decontaminated.

5.3.5 Breaking Containment

Prior to breaking containment, a Supervised Area will be designated and heavy-duty polythene sheeting used to cover the deck within the whole Supervised Area, or at least in areas where scale may fall. Drains will also be covered.

Personnel entering the Supervised Area will wear appropriate PPE, and will monitor for NORM contamination once the equipment has been opened. If a “sustainable rise above background” is recorded a Controlled Area will be established.

The Controlled Area will be marked by barriers and tape, with signs stating that it is a NORM Controlled Area and that entry is restricted. All NORM handling procedures must be enforced within this area, e.g. protective clothing must be put on at the entry point and removed and decontaminated at the exit point. Entry must be restricted to people directly involved in the work.

If removal of NORM waste from the vessel / equipment is required, samples of NORM scale, sludge, etc will be obtained in accordance with Appendix D and sent to the Tracerco laboratory in Billingham.

Removal and storage of NORM waste from the vessel / equipment will be carried out in accordance with Section 5.4 and the equipment closed up.

When the work is complete, a contamination check will be made of the Controlled Area. The area will be cleaned down, and the deck below the polythene sheeting checked for contamination.

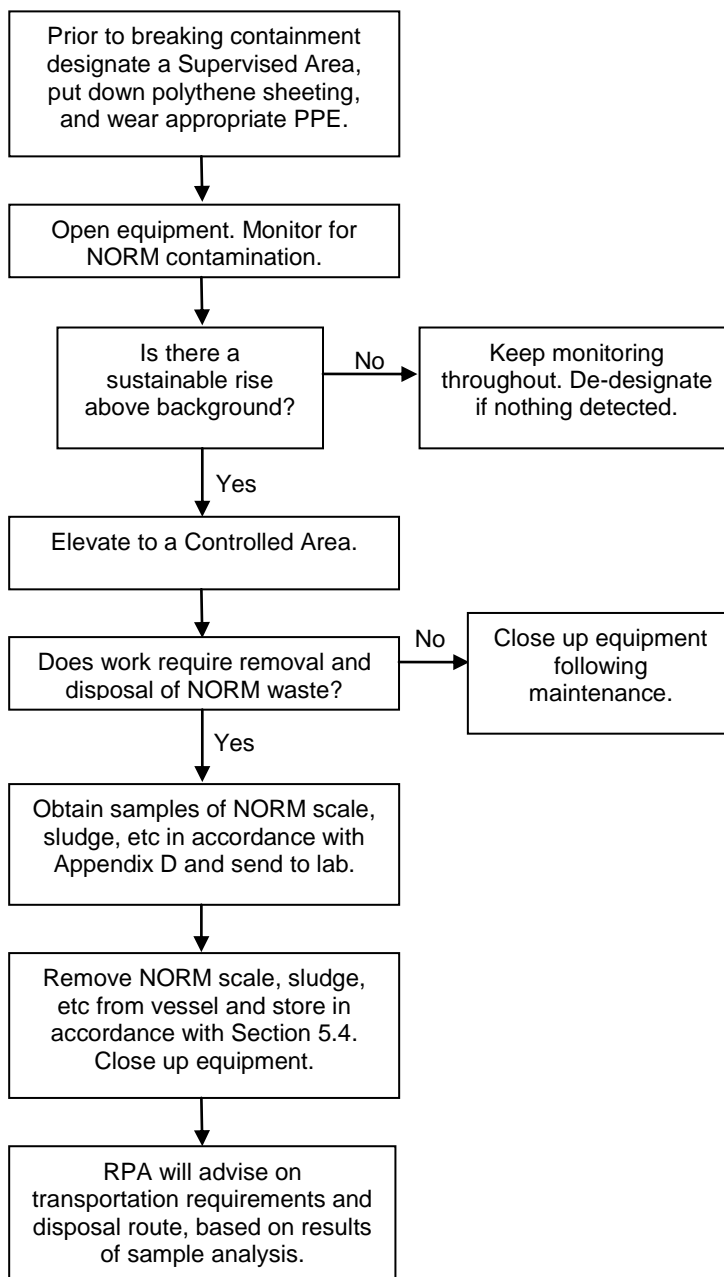
The RPA will advise on transportation and disposal requirements for the NORM waste (through the AzSPU RP SPA), based on the results of the sample analysis.

A flow chart summarising this process is provided in Figure 2.

5.4 Storage Arrangements for NORM Contaminated Material

Storage arrangements for NORM contaminated material will meet the following general requirements:

- Only suitably qualified and experienced persons (RPS and those who have had appropriate training) shall have access to the radioactive waste (with measures taken to prevent access by others).
- The premises where radioactive waste is being accumulated shall be constructed and maintained in such a way and condition that they can be easily decontaminated.
- The storage area will provide protection from the effects of the weather.

Figure 2: Breaking Containment - Vessel Entry

5.4.1 Handling

Bulk Material

Contaminated bulk material must be placed in good quality steel drums with secure lids. The drums will be no more than three quarters filled and bulk material should be contained within sealed heavy-duty polythene bags within the drums.

The site RPS, or other nominated person, will check the drums for external contamination, and if any contamination is found it will be removed fully by wiping with a rag. Contaminated rags will also be placed in the drums.

Contaminated Equipment

Contaminated equipment will be immediately secured in such a way as to prevent spread of contamination to other items, work areas or personnel.

Any item contaminated internally will be sealed to prevent contamination from escaping e.g. contaminated tubulars will be sealed with end caps, and the seals wrapped with polythene and taped.

Contaminated items must not be allowed to dry out in the atmosphere. They must either be suitably sealed, or kept moist.

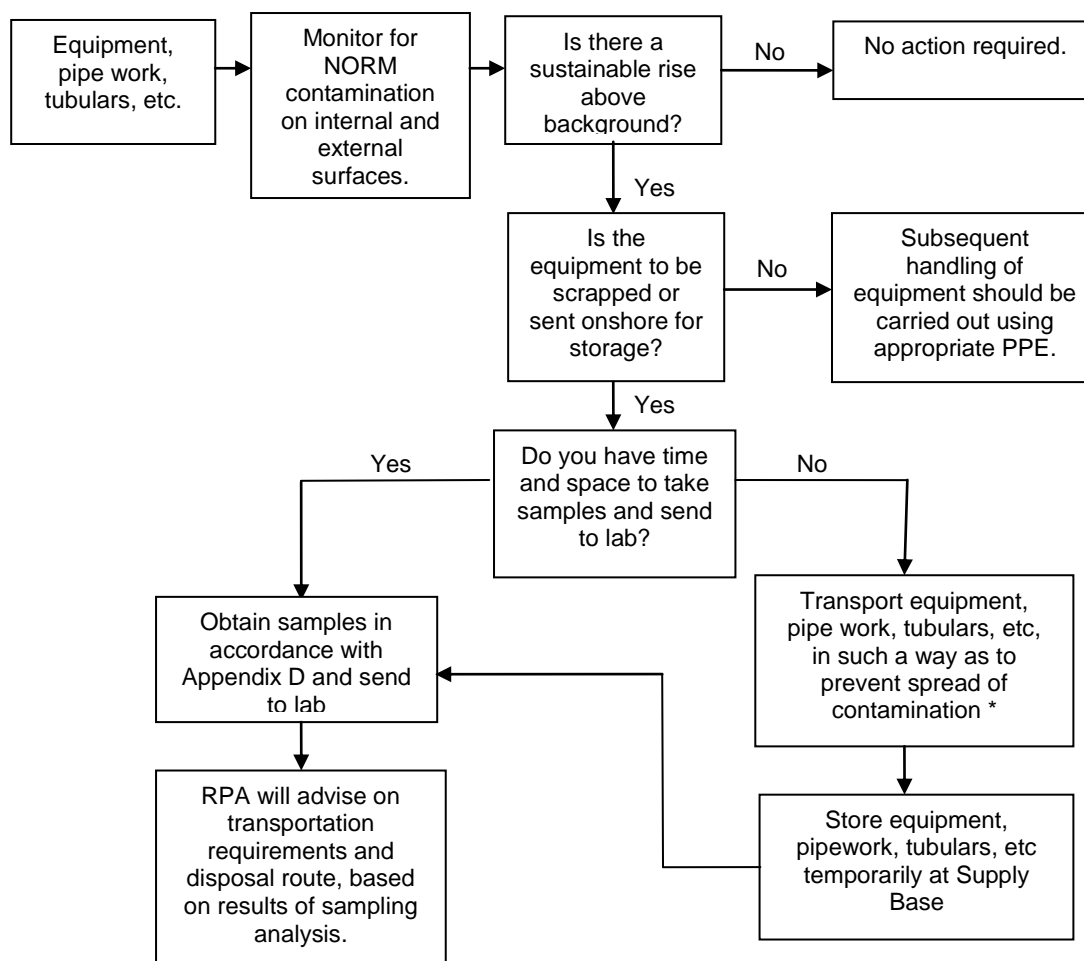
Tubulars will be stored in bundles, or stows, and not directly placed on the ground. If there is a possibility that weather could affect the integrity of the containment measures then additional protection will be provided, e.g. wrapping of tubular bundles in heavy duty polythene sheeting that is secured in place.

Items other than tubulars will be placed in fully sealable containers, or units that can be covered.

Any pieces of scale falling out of contaminated equipment / tubulars must be inserted back into the equipment which will then be sealed / capped.

Items that are externally contaminated will be wrapped in heavy-duty polythene sheeting (to ensure total enclosure) and taped.

A flow chart summarising the handling of NORM contaminated equipment is provided in Figure 3.

Figure 3: Handling of NORM Contaminated Equipment and Tubulars

* Must meet specifications listed in Section 5.2 of the AzSPU Procedure for Transportation of Radioactive Materials if being sent unpackaged.

5.4.2 Marking and Labelling of NORM Contaminated Material

Bulk Waste

A label with the legend “Radioactive” and the radiation trefoil will be attached to each drum. The label will include details of the name of the site, the origin of the waste, the date produced and a unique reference number. The unique reference number must be traceable to samples or a sample reference number for the waste. The label will also be marked “Solid Waste”, “Contaminated Fluids” or some other appropriate description of the form of the waste.

Contaminated Items

Each contaminated item will be identified with yellow / black NORM tape and a suitable, indelibly marked label or marking on the item stating ‘Radioactive NORM’. Items will be marked with name of the site, date produced and a unique reference number, which will be used for other documentation relating to the particular waste.

In terms of contaminated tubulars, each joint must be identified with its well and tubing string number, which should be painted on the joint where possible.

When transporting contaminated tubulars in bundles, NORM tape must be wrapped round the legs of the sling to aid identification. Individual tubulars should also be marked. Do not tape complete bundles as the tape inevitably breaks and falls off in transit.

The total activity of the waste on each item will be estimated using average contamination measurements in Bq/cm² and multiplying this by the estimated surface area covered by the waste in cm², to give a figure in Bq.

5.4.3 NORM Storage Areas

Drums of NORM, or wrapped contaminated items, will be stored in a skip or banded area with tarpaulin or some other form of cover. This area should also be barriered and access restricted to authorised persons only i.e. persons involved with NORM work.

Offshore, if deck space is short and larger items cannot fit in a waste store, then any temporary storage area must be secure and procedures in place to control access.

Only NORM waste may be stored in the NORM storage area and it must be ensured that the storage area is away from other major hazards such as explosives or corrosives.

Warning signs must be displayed around the NORM storage area with the radiation trefoil symbol and the legend "Radioactive. NORM Storage Area. No Unauthorised Access".

The OIM/Site Manager, with the assistance of the site RPS, will ensure that the waste is transferred from site as soon as reasonably practicable (see Section 5.5). Waste will normally be transferred within three months of being accumulated. If this is not practicable then the OIM must review the situation and ensure that arrangements are made for the waste to be transferred within six months of being accumulated. If this cannot be achieved then the AzSPU Radiation Protection SPA and the RPA will be consulted.

Dose rate monitoring must be carried out around bulk accumulations and around contaminated equipment stows. If the dose rate exceeds 7.5 µSv/h at 30 cm from drums, or stows then a Controlled Area must be designated and appropriate barriers and signage in place.

NB: If storage of NORM waste is initiated on-site, the AzSPU Radiation Protection SPA needs to be notified immediately so that a 'Special Permission' can be obtained from the MENR.

5.4.4 Records & Inspection

The site RPS will ensure that details of all NORM waste being accumulated and stored are added to the Waste Accumulation and Storage Record (Appendix F).

The inventory of waste items will be checked on a regular basis, e.g. weekly, by the site RPS. At the same time the storage arrangements will be reviewed to ensure they remain adequate.

5.5 Transportation & Disposal of NORM Contaminated Equipment and Waste

The transportation and disposal requirements for NORM contaminated equipment and waste are dependent on whether the waste is classed as Exempt, in accordance with the IAEA specifications (see Section 3).

Exemption is the determination by a regulatory body that a source or practice need not be subject to some or all aspects of regulatory control, on the basis that the exposure (including potential exposure) is too small to warrant the application of the requirements.

The RPA (through the AzSPU RP SPA) will advise on the transportation and disposal requirements, based on the results of the sampling and analysis.

The AzSPU Procedure for Transportation of Radioactive Materials ([AzSPU-HSSE-DOC-00115-2](#)) provides further detail on transportation of NORM contaminated waste and equipment, and NORM samples.

6 Key Documents/Tools/References

This document shall, where appropriate, be used in conjunction with of the following procedures and plans:

Document Number	Title of Procedure
AzSPU-HSSE-DOC-00058-2	Procedure for Management of Radioactive Materials and Radiation Generators
AzSPU-HSSE-DOC-00115-2	AzSPU Procedure for Transportation of Radioactive Materials
AzSPU-HSSE-DOC-00086-2	AzSPU Radiation Contingency Plan
AzSPU-HSSE-DOC-00083-2	AzSPU Procedure for The Import / Export of Radioactive Materials and Sources of Ionising Radiation
AzSPU-HSSE-DOC-00025-2	AzSPU HSSE Document Management Procedure
AzSPU-HSSE-DOC-00021-2	AzSPU HSSE Definitions

References:

OGP (International Association of Oil and Gas Producers), 2008. Guidelines for the Management of NORM in the Oil and Gas Industry. Report No. 412.

Revision/Review Log

Revision Date	Authority	Custodian	Revision Details
7 th October, 2009	Yuliy Zaytsev (Safety & Compliance Manager)	Idrak Nazarov (HSE MS Team Leader)	Initial Issue.

Appendix A – NORM Monitoring of Tubulars

Well control equipment and tubulars that have been used to produce reservoir fluids have the potential to be contaminated with NORM, monitoring will therefore be carried out during the drilling operation by the site RPS, or an Authorised Monitor User.

Initial Actions

- A supply of tubing end caps will be on hand for sealing the complete string in the event that contamination is found and it is to be removed from the well.
- Heavy duty polythene sheeting and sleeves will be provided for wrapping externally contaminated items.
- The drill floor will be designated a Supervised Area if contamination is detected and access will be restricted. Personnel at risk of exposure will wear suitable PPE (see Section 5.3.4) and appropriate washing and changing facilities will be provided at the entry to the area. If there is a significant risk that contamination may be spread, then the area designation will be elevated to a Controlled Area.

Identification of NORM Contamination

The site RPS, or an Authorised Monitor User, will monitor all well control equipment (e.g. tubing hangers, down-hole safety valves) as they are removed, ensuring all accessible internal surfaces are monitored. If contamination is detected, open flanges must be sealed with flange protectors or heavy-duty polythene sheeting and secured with NORM tape.

If contamination is later detected on the tubing string then it must be assumed that down hole valves and pumps are internally contaminated, unless they have been monitored internally and shown to be clean.

As the tubing string is pulled, the first five joints will be monitored for contamination and if none is found then every tenth joint thereafter will be monitored. If a contaminated joint is found, then all joints up to the last one to have been monitored, will be checked. All subsequent joints will then be monitored.

All monitoring outcomes must be recorded on the NORM Contamination Monitoring Log (Appendix B). In the event that contamination is found, then a NORM Survey Report (Appendix C) must be completed.

If the tubulars are to be reused, subsequent handling must be carried out using appropriate PPE. If the tubulars are to be scrapped, sampling and analysis must be conducted prior to disposal.

Monitoring of Logging Tools

Some logging tools contain radioactive sources. Monitoring should only be carried out prior to sources being loaded into the tools or after the sources have been removed.

In addition, some logging tools that use neutron generating devices can become 'activated' i.e. the casing of the tool becomes radioactive (note, not contaminated) for a period of time after the tool has been energised. If a tool could have been activated during operation then it should be isolated for several hours after retrieval and then checked. If contamination is apparently detected then the tool should be left for around 1 hour to see if the contamination level decreases. Only then should a decision be made as to whether it is contaminated or not.

Appendix B - NORM Contamination Monitoring Log

Installation _____

Ref	Date	Monitor Details		Monitor Check		Item Description	Test Results			Signed
		Type	Serial No.	Check (c.p.s.)	Pass /Fail		Bkgd (cps)	Test (cps)	Net (cps)	

Appendix C - NORM Survey Report

Installation: _____ Report No.: _____

Plant Description		Plant I.D. No.	
Monitor Type:		Monitor Serial No.:	
No. of samples		Reason if none:	
Sample references			
Comments:			

Vessels			
Reason for Survey	Pre-entry check <input type="checkbox"/>	Pre-cleaning check <input type="checkbox"/>	
Monitoring Results	c.p.s	Bq/cm ²	μSv/h
Quantity of Material (scale, sand, sludge, other etc)	Estimated Volume (m ³)	Estimated Weight (kg)	Estimated Thickness (mm)
Action Taken	Not Removed <input type="checkbox"/>	Storage <input type="checkbox"/>	Discharged <input type="checkbox"/>
Comments			

Spools / Valves / Other			
Reason for Survey	Removed for Repair <input type="checkbox"/>	Removed for Cleaning <input type="checkbox"/>	
	Removed to Replace <input type="checkbox"/>	Other <input type="checkbox"/>	
Monitoring Results	c.p.s	Bq/cm ²	μSv/h
Quantity of Scale etc.	Estimated Volume (m ³)	Estimated Weight (kg)	Estimated Thickness (mm)
Action to be Taken	Return to Service Uncleaned <input type="checkbox"/>		
	Clean Offshore <input type="checkbox"/> Return to Service <input type="checkbox"/> Scrap Item <input type="checkbox"/>		
	Clean Onshore <input type="checkbox"/> Return to Service <input type="checkbox"/> Scrap Item <input type="checkbox"/>		
Comments			

Production Tubing / Downhole Equipment			
Reason for Survey (i.e. reason removed)	Renewal <input type="checkbox"/>	Workover <input type="checkbox"/>	Other <input type="checkbox"/>
Monitoring Results	c.p.s	Bq/cm ²	μSv/h
External Scaling	Yes <input type="checkbox"/> No <input type="checkbox"/>		
Action to be Taken	Return Downhole Uncleaned <input type="checkbox"/>		
	Clean Onshore and Re-use <input type="checkbox"/>		
	Clean Onshore and Scrap <input type="checkbox"/>		
Comments			

Appendix D - Sampling Protocol for NORM

Introduction

If a positive sustainable rise above background is observed during radiation monitoring then representative sampling should be conducted (if the intention is to dispose of the contaminated equipment, NORM scale, etc). **The activity concentration of NORM materials can only be determined by radiochemical analysis.**

The site RPS will conduct any required sampling as follows:

Process Vessels

Where progress through a vessel can be made on entry, an initial contamination survey will be conducted under the supervision of the site RPS.

Where a positive sustainable rise above background is observed, samples of materials (e.g. sand, sludge, scale) will be taken. The number of samples required of each form of material will be determined by the RPS, based on the quantity of material and the range of contamination monitor readings obtained.

Samples will be taken from the front, middle and back of the vessel - five samples from each area. These will then be aggregated for each area and a representative sample taken from each and sent for radiochemical analysis (3 samples in total).

Sample sizes should meet the following criteria for the purposes of transportation:

- 1-4 samples – maximum weight per sample 50g.
- 5-8 samples – maximum weight per sample 25g.

Where progress through a vessel is determined by the progressive removal of internal fittings, monitoring will be carried out whenever a new internal surface is exposed. Representative sampling will also be done at each stage if recordings above background are detected, again paying attention to possible different forms of the material. Where considered appropriate by the RPS, on the basis of the contamination readings observed, such samples may be aggregated and a representative sample analysed.

Tubulars

In order to obtain a sample, scrape approximately 25 - 50g of material into a small container (e.g. 100 ml sample pot with screw lid) using a spatula or other suitable tool. Fix a lid on the container and add tape to the seal to prevent leakage. The RPS should ensure that representative samples are taken from the batch of tubulars e.g. a sample from the most contaminated, the least contaminated, and those in between.

Pigging Wax

If a positive sustainable rise above background is observed whilst monitoring pigging wax, at least two 50 g representative samples will be required from each drum of wax. The volume of wax must be recorded.

Contaminated PPE

PPE that has been cleaned but which still retains activity levels above background should be placed in sealed drums and a representative sample taken. The RPS shall identify the contaminated PPE which gives the highest counts per second (cps) on the contamination monitor, remove a section and place into a 50g sample pot.

Sample Storage

Samples should be placed in a secure container (sample pots can be obtained from the Tracerco laboratory), with the lid sealed with tape and labelled to indicate the radioactive nature of the material, the date, origin and site. Unless being immediately despatched, the samples will be securely held by the site RPS, or other Authorised Person, in a suitable store, labelled with the radiation trefoil and the legend 'Radioactive'.

Transport of Samples

All samples are to be sent for analysis to the Tracerco laboratory in Billingham (address provided in Appendix B of the AzSPU Procedure for Management of Radioactive Materials & Radiation Generators ([AzSPU-HSSE-DOC-00058-2](#))).

Section 5.3 of the AzSPU Procedure for Transportation of Radioactive Materials ([AzSPU-HSSE-DOC-00115-2](#)) provides more detail on how to transport NORM contaminated samples.

Records

Details of all samples taken and sent for analysis will be added to the site NORM Sample Register (Appendix E).

Copies of the sample analysis results will be filed in the Site Radiation Records and must be kept for five years.

The weights of the material to be disposed of will be calculated by direct measurement or by volume calculations. AzSPU has the responsibility of ensuring that there is some way of documenting how the weights were arrived at.

Installation: _____ **Year:** _____

[illegible]

Appendix F – NORM Waste Accumulation and Storage Record

Installation: _____

Unique I.D.	Description of material / Item	Weight ¹ (kg)	Storage Location	Date In	Disposal Route	Date Out	RPO

1. An estimate of the weight of bulk material should be made and recorded here.