

Purpose The purpose of this document is to reduce personnel exposure from Naturally Occurring Radioactive Material (NORM) as low as reasonably achievable (ALARA). This material can accumulate on production piping or equipment over time. Examples of NORM include:

- Radium 226.
- Radon 222.
- Barium Sulfate.
- Natural by-products which are deep in the earth.

In scope / out of scope The following is in scope and out of scope of these requirements.

In scope	Out of scope
NORM and other low-level sources of radioactive material such as radioactive fracturing media (i.e., beads, tritium)	Radioactive sources managed under the State of Alaska or NRC licensing.

Affected equipment NORM can affect the following equipment:

- process equipment,
- piping and downhole tools which have been in contact with crude oil, natural gas, or produced water.

NORM often accumulates in scale [or sludge/residual fluids](#) on or inside of equipment, piping, or vessels.

Health & Safety (HSE)/ Industrial Hygiene Representative Responsibilities [HSE & Industrial Hygiene will:](#)

- **Monitor** compliance through self-audits.
- **Provide** technical resources and tools for manual application.
- **Maintain** required NORM records as outlined by this manual and applicable state requirements.
- **Maintain** NORM detecting instruments are calibrated annually and in good working order.

Environmental Representative Responsibilities [Field environmental coordinator will:](#)

- **Ensure** appropriate waste determinations are made.
- **Support** waste disposal processes.

NORM Material Survey and Disposition Form The NORM Material Survey and Disposition Form is available [here](#).

HSE Requirements: Naturally Occurring Radioactive Material



Owner: COPA IH

Work-force requirements to reduce exposure potential

Workforce requirements to reduce potential NORM exposure:

Always	<ul style="list-style-type: none"> • Ensure a NORM survey is completed before releasing potentially contaminated equipment for disposal, sale, laboratory analysis or maintenance/repair. • Contact HSE or IH Representative with questions on NORM Surveys. • Prevent direct skin contact with scale and solids. • Practice good work site hygiene. • Handle NORM contaminated material in a wet state. • Seal all tubing with thread protectors to contain NORM material/scale and residual fluids. • Contain NORM contaminated materials with plastic sheeting on flooring/ground where work is performed.
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NORM Survey and Labeling

NORM survey and labeling are completed by HSE staff or NORM Trained personnel on material or equipment with reasonable potential to have NORM. There is a detailed HSE Desk Reference covering NORM in the HSE File Library [here](#).

Conduct NORM surveys	<ul style="list-style-type: none"> • On all equipment prior to intracompany transfers. • On used oil and gas process equipment prior to disposal. • When conducting due diligence to ensure proper identification of contaminated sites and equipment. • On all used oil and gas process equipment being removed from service (e.g., vessels, line pipe, tubing, and tanks) prior to sale or release for unrestricted use (i.e., sale to third parties, including scrap dealers). • Prior to commencing work when cleaning or working on processing or production equipment where airborne particulates have the potential to be generated.
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[Training Course: Naturally Occurring Radioactive Material \(NORM\) \(Alaska\)](#)

COPA NORM Action Level

The COPA NORM action level is 50 $\mu\text{R/hr}$ [*microRoentgens/hour*].



NOTE: Measurements must be taken in Gamma level as it is used as a marker to indicate the levels at which additional controls and practices are needed.



Standard survey instrument

The standard survey instrument is the Ludlum Model 3 or 3-IS survey meter, with a sodium iodide scintillation detector (44-2 probe). Other equivalent Survey instruments may be used if equipped, with an internal Geiger Mueller (GM) tube for Gamma detection. Readings are in micro Roentgens/hour ($\mu\text{R/hr}$) Gamma.



NOTE: Ludlum survey meters are under the reporting limit and not required to be registered with the State of Alaska or licensed by the NRC.

Radiation Monitoring Equipment requirements

Radiation monitoring equipment must meet the following:

- Calibrated annually by the manufacturer, or sooner if repair is performed,
- All repairs performed by the manufacturer and calibrated after.

Hot work permit required before monitoring in a classified area

A Hot Work Permit is required before using non-intrinsically safe survey instrument or monitoring equipment in a classified area.



NOTE: This should be noted in the model literature such as "Model 3-IS".

Materials groups responsibilities

The North Slope materials groups have oversight of used production equipment that may be contaminated with NORM.

- **Secure** equipment over NORM Action Level. Provide storage for transfer/disposal. Post signage in area as "restricted area/authorized personnel only".
- **Ensure** documented surveys accompany equipment, sold, sent to a third party, or re- used and stored.
- **Manage** DOT compliance during transfer and shipment of NORM contaminated materials.

Procedures and guidelines for operations activities

The [supplemental procedures and guidelines](#) developed by Operations should be followed during:

- Dismantling equipment.
- Scale removal.
- Vessel entry.
- Transporting contaminated material.
- Disposition.