Policy

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Radiation Detector Protocol

Confederation of European Waste-to-Energy Plants, Ireland

Introduction

This Protocol sets out the procedure that will be followed by CEWEP Ireland Members in monitoring incoming waste to Indaver's Meath facility located at Carranstown, County Meath and Dublin Waste to Energy's facility located at Poolbeg, Dublin.

This Protocol has been informed by international best practice and is designed to further protect public health and the environment.

Abbreviations

ORM	Office of Radiation Protection & Environmental Monitoring
OEE	Office of Environmental Enforcement
PPE	Personal Protective Equipment
RPO	Radiological Protection Officer
RPA	Radiation Protection Adviser
PTPL	Pre-treatment Process Leader

Background

Waste-to-Energy facilities are required to install a radiation monitoring system (to be determined by each respective facility) to monitor the radiation level of waste delivered to each facility. This system is located at the inbound weighbridge(s). This system scans vehicles for radioactivity and distinguishes short and long life isotopes. The monitoring system will be interlocked with the traffic light system on the weighbridge. This will ensure that should a waste delivery trigger the alarm the driver will not be permitted to proceed. The waste will be held on the weighbridge until a member of staff informs the driver and explains why the detector has been activated.

Training

All management and staff who will be involved in implementing this protocol will receive training from a registered Radiation Protection Adviser. Written records of this training will be maintained in the employee training records at each respective facility. Only trained personnel may use portable radioactive detection instruments. Handling of sources of ionising radiation will be carried out by trained professionals only.

Review

The Protocol shall be updated within three months of commencement of operation of the radiation detectors in each respective Member's facility. Thereafter, the Protocol shall be updated annually.

Protocol

At all times and prior to a Member facility contacting the EPA (OEE or ORM) the respective member shall seek direction and guidance, as necessary, from the RPO and RPA.

When a waste delivery arrives on a CEWEP site the driver follows the site delivery procedures before driving onto the weighbridge. The driver then proceeds onto the weighbridge and through the monitoring system. If the truck does not register an alarm the driver can continue to the tipping hall to unload the waste into the waste bunker as normal.

If the truck activates an alarm on the monitoring system and is measured as per *Table 1: Radiation Testing* Case 12 or 13 the delivery will be accepted as normal and proceed to the tipping hall to be tipped in the waste bunker. If the alarm is activated and is measured as per the *Table 1: Radiation Testing* - Case 1 to 11, the gatehouse will instruct the driver to reverse off the weighbridge completely and then re-enter the weighbridge to scan through the monitoring system again.

If the alarm does not activate again the truck will again be asked to reverse off the weighbridge and re-enter to scan through the monitoring system for a third time to ensure there is no source of ionising radiation in the delivery. If the delivery is free of a source of ionising radiation, it will be accepted as normal and will go to the tipping hall to be tipped into the bunker.

If the alarm does activate after the truck has re-entered the weighbridge then the driver will be informed that a source of ionising radiation has been detected in their delivery. With the agreement of the driver the delivery will be quarantined and in cases 1 to 8 and 10 to 11 in Table 1 the ORM will be notified after guidance has been sought from the RPO and RPA.

The vehicle will remain on the weighbridge or in a designated adjacent area until it is deemed safe to proceed with the delivery. The driver will be included in the scan of the vehicle. If the driver is determined to be the source of the ionising radiation, this will be documented and the vehicle will then be tipped.

In cases 2 to 11 of Table 1 the delivery which activated the alarm will be sent to the tipping hall once the Shift Leader has deemed it safe to do so following the completion of the Radiation Unloading Checklist. This Checklist is attached to this Protocol in Annex 1.

The Tipping Floor Operator will be notified that a truck has alarmed and needs to be processed in the tipping hall. The Operator will put on his/her personal dosimeter badge and appropriate PPE (standard site PPE plus, disposable coverall suit, disposable gloves, disposable overshoes). The operator using the hand held radiation detector will scan both sides of the trailer in the area identified by the monitoring system and the monitoring Report.
If the radiation level is confirmed to be within acceptance limits (<100 micro Sieverts/hr), and the approximate location of the source of ionising radiation on the truck is identified, where possible a portion of the delivery of

non contaminated waste will be tipped in front of one of the open tipping gates. The remaining waste will be tipped in front of allocated tipping gates or in the Waste Quarantine Area. A second Operator using the loading shovel will spread the delivery on the floor. The operator with the hand held detector will then scan the loose waste on the ground until the source of the ionising radiation is found.

Once located, the source will be removed from the waste and placed in a pre labelled container with the following information attached:

- “date of quarantine”;
- “delivery/sales order number”

This operation should be undertaken using a long handled instrument, i.e. a shovel for example. The source should never be handled directly by the operator and should be maintained at the maximum distance possible from the body. This container is then placed in a designated storage area. The protective principles of Time, Distance and Shielding will be applied at all stages of this process.

The radiation dose rate external to the storage area will be checked with the hand held monitor and it will be ensured that radiation dose rates in adjacent areas are acceptable (ideally no greater than background radiation levels). This may be achieved by additional shielding or cordoning off the store area at safe distances as necessary. The waste will then be stored for ten times the half life (if it is a short lived isotope) and then treated as a normal (non radioactive) source of ionising radiation.

If the radiation level is confirmed to be above acceptance limits (>100 micro Sieverts/hr) the truck will be instructed to go to the quarantine area and the ORM will be contacted after guidance has been sought from the RPO and RPA. In this event, no further action will be taken until either the Radiation Protection Adviser or a representative from the ORM attends the site, assesses the situation and advises on what action should be taken.

If the driver fails to cooperate with the management and staff on site and insists on leaving the site, the details of the vehicle will be taken and the ORM advised.

Records of all alarm activations and actions taken, including measures to identify sources of ionising radiation, shall be retained in each respective Member’s facility. Records shall be maintained on-site in each respective Member’s facility.

Table 1: Radiation Testing

Case	Reading >100 micro Sieverts/hr	Strong signal (>10kcps)	Weak signal (<10kcps)	Long lived isotope	Short lived isotope	Unidentified isotope	Point source	Non-Point source	Action
1	x								Call ORM/RPA and follow their advice
2		x		x			x		Unload and quarantine waste with source if safe to do so, Call ORM
3		x		x				x	
4		x				x		x	
5		x			x			x	
6			x	x			x		
7			x	x				x	
8			x			x		x	
9		x			x		x		Unload when safe to do so, find and store source for 10xHalf-life
10		x				x	x		Unload when safe to do so and find source. Use the hand held detector to identify isotope: 1. Store for 10xHalf-life if it is a short-lived isotope (case 9) 2. Quarantine and call ORM if it is a long-lived isotope (case 2) or remains unidentifiable
11			x			x	x		Unload when safe to do so and find source. Use the hand held detector to identify isotope: 1. Treat as normal if it is a short-lived isotope (case 12)

									2. Quarantine and call ORM if it is a long-lived isotope (case 6) or remains unidentifiable
12			x		x		x		Treat as normal
13			x		x			x	Treat as normal
14	**Background only**			**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	Treat as normal

Annex 1: Radiation Unloading Checklist

Considerations Before Unloading a Load with a source of ionising radiation		**Comments**
Are there available personnel onsite?	Yes/No	
How many waste trucks are waiting to tip in the bunker?	(1 - 10)	
How many trucks are scheduled?	(1 - 60)	
Are there palletised deliveries to be/or being unloaded?	Yes/No	
Is the front loader available?	Yes /No	
Is there other activities going on in the tipping hall?	Yes/No	
How many gates are open for deliveries?	(1 - 6)	
Bunker level	Ok/Nok	