

BOFORS TEST CENTER



APPREMIER FOR DISTRICT

FULMINATION 2023

JON TOREHEIM



WHAT HAPPENS TO OBSOLETE EXPLOSIVES?

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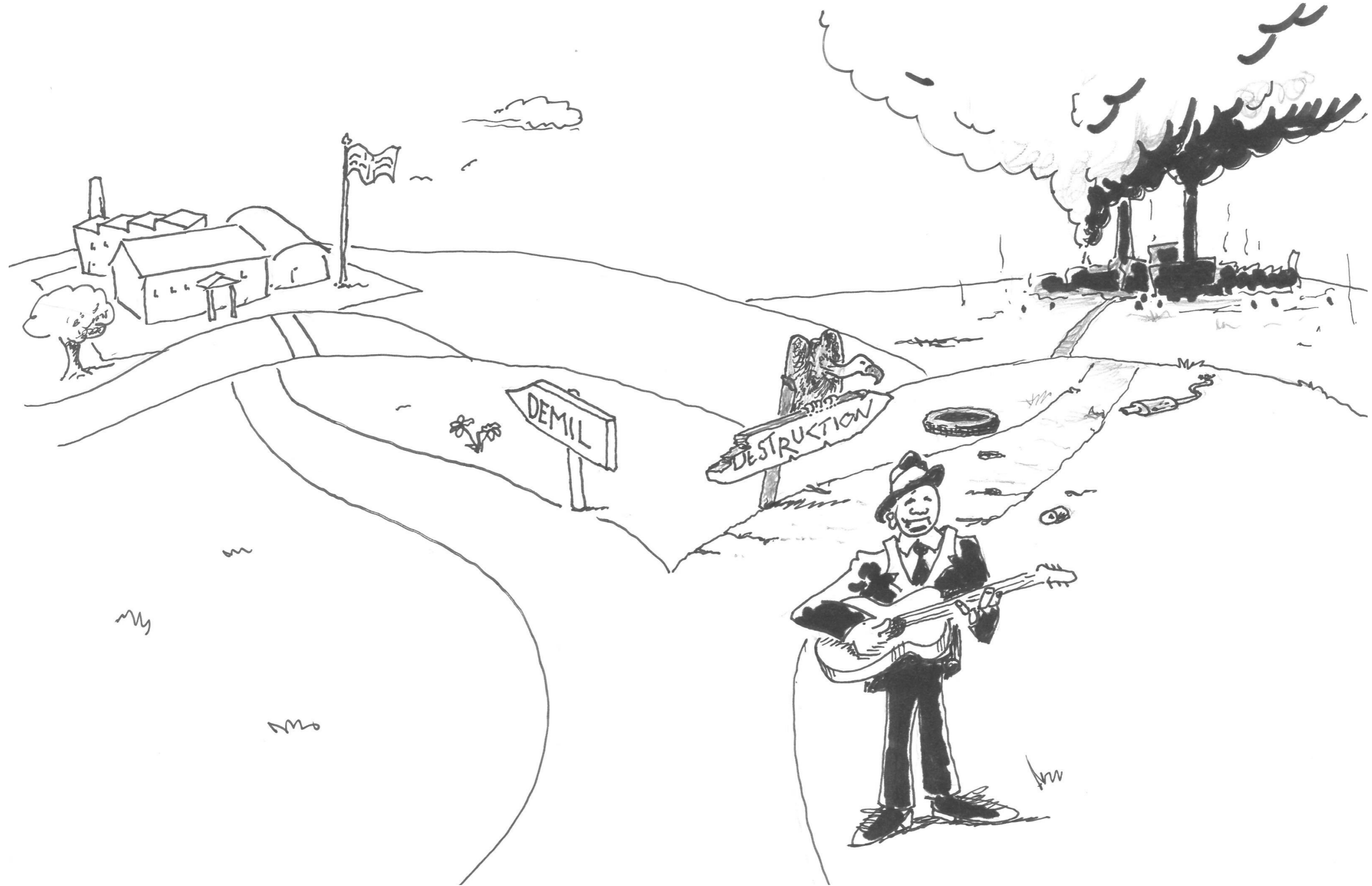


WHAT YOU CANNOT SEE...

...DOES NOT EXIST

THE OLD FASHIONED APPROACH

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**DESTRUCTION IS ALSO
REQUIRED FOR OBSOLETE
AND/OR CONTAMINATED
AMMONIUM NITRATE EMULSIONS
(ANE)**

VIHTAVUORI, FINLAND, 9 JULY 2013

“The emergency services were alerted when a chemical reaction occurred in an intermediate bulk container (IBC) which contained bulk-emulsion explosive waste.”

“The situation was hazardous because the container was stacked together with about 200 other waste containers at a distance of approximately five metres from an explosives warehouse.”

“At that precise moment, the major risk was seen to be an explosion, whose pressure effects could extend to a radius of about 1300 metres from the warehouse.”

“The rescue services decided to evacuate all the inhabitants in the area before they attempted to move the container and cool down the interior. To safeguard all the inhabitants, the evacuation was extended to cover the whole Vihtavuori village, which has about 2000 inhabitants.”

“After a successful rescue operation, the evacuation was completed during the same evening.”

From *“Major accident risk in Vihtavuori: investigation report abstract”*, Tukes

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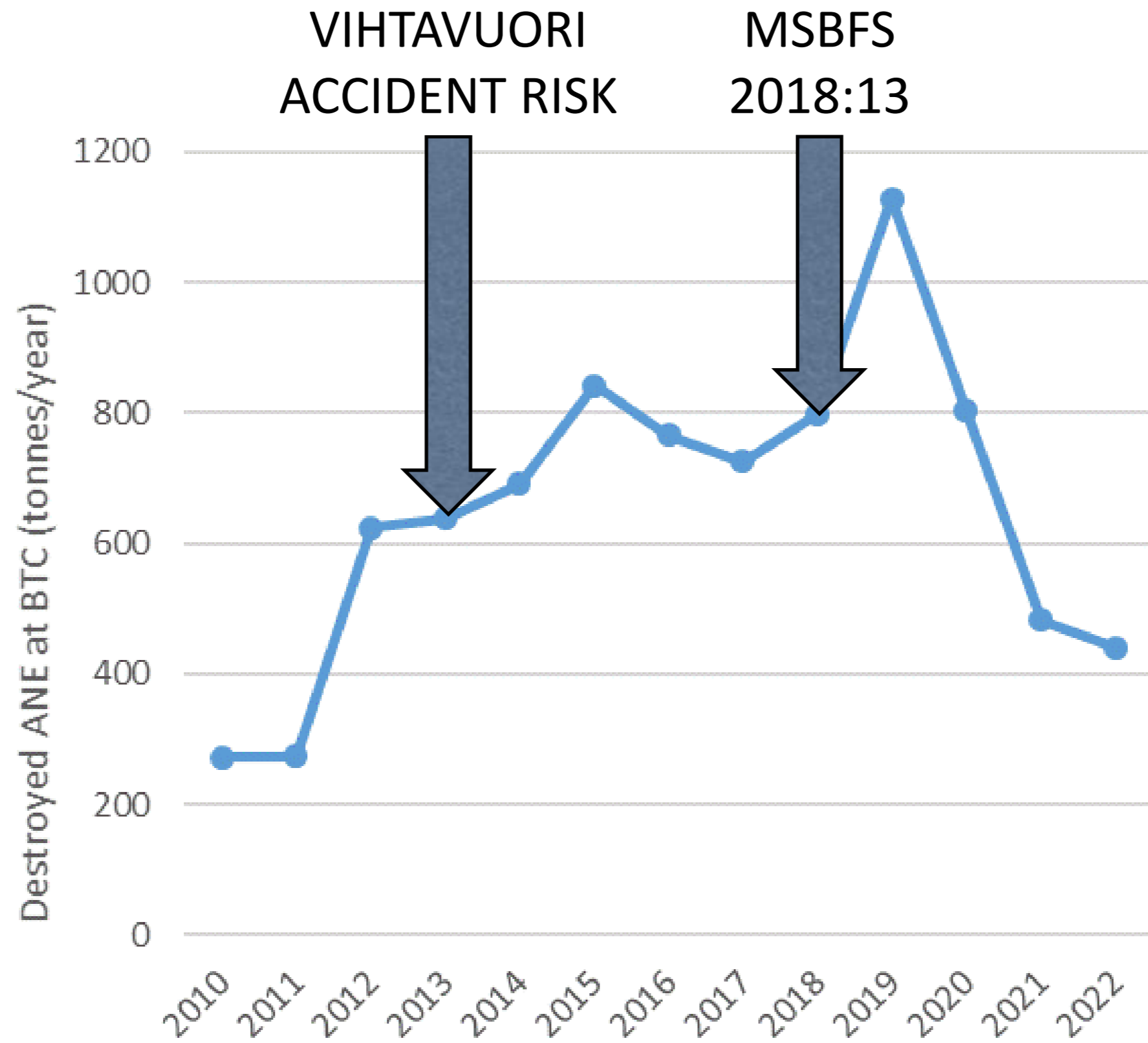
“CONTAMINATED ANE... ..SHALL WITHOUT ANY DELAY BE
SENT FOR DESTRUCTION”

MSBFS 2018:13 (SWEDISH CIVIL CONTINGENCIES AGENCY)

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WELL, DID ANYONE CARE?

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HOW ARE EXPLOSIVES AND ANE DESTROYED?

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A large fire is burning in a wooded area, with thick black smoke rising into the sky. The fire is intense, with bright orange and yellow flames. In the background, there are several trees and a red container. The text "WELCOME TO HELL" is overlaid in large, white, bold, sans-serif capital letters across the center of the image.

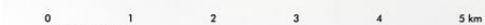
**WELCOME
TO HELL**

BOFORS SKJUTFÄLT

Information om pågående verksamhet kan erhållas på <http://www.skjutfalten.se>

Rör inga ammunitionseffekter, livsfar!

Passera aldrig en stängd grind/bom, livsfar!



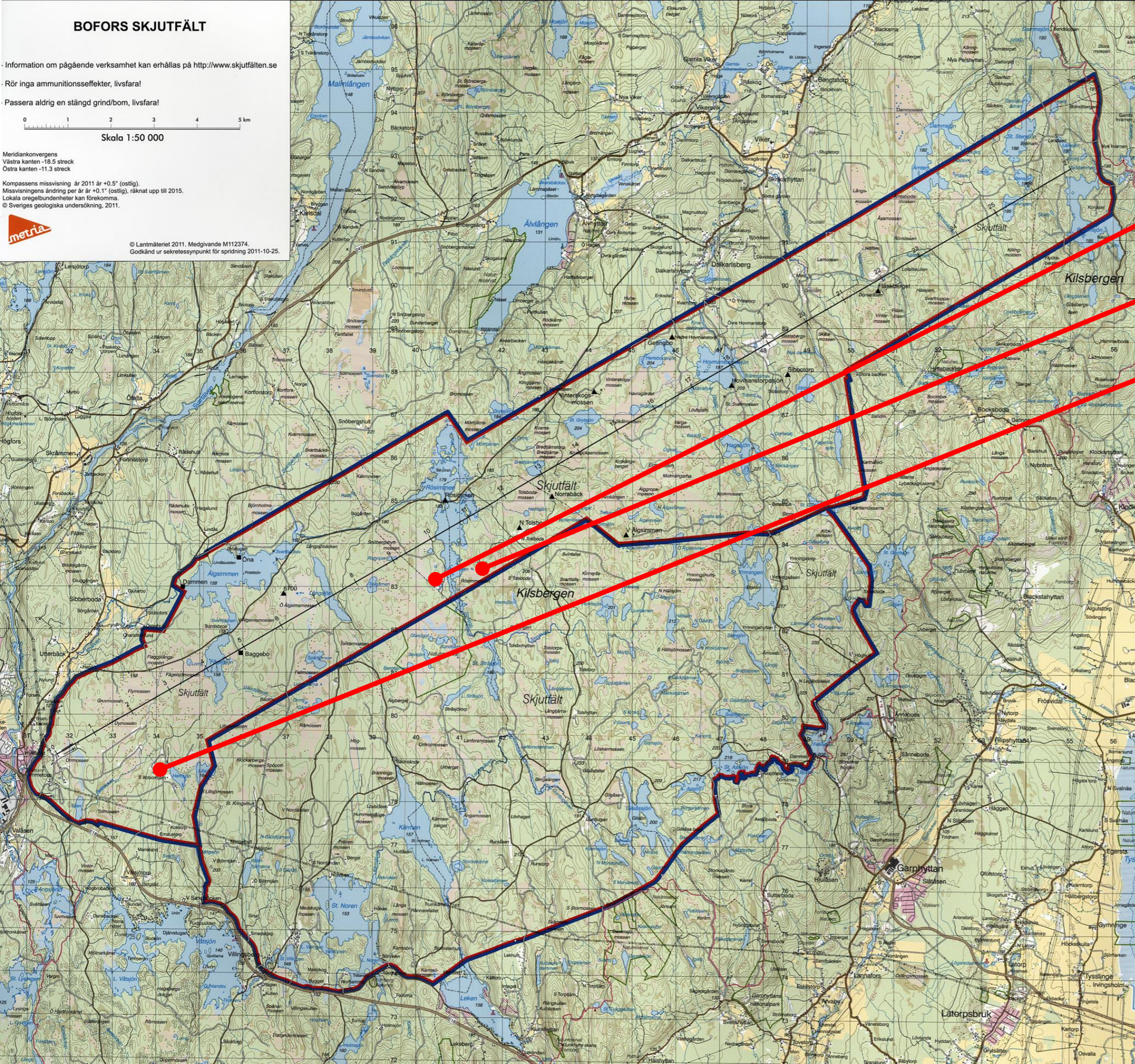
Skala 1:50 000

Meridiankonvergens
Västra kanten -18.5 streck
Östra kanten -11.3 streck

Kompassens missvisning år 2011 är +0.5° (ostlig).
Missvisningens ändring per år är +0.1° (ostlig), räknat upp till 2015.
Lokala orogebundenheter kan förekomma.
© Sveriges geologiska undersökning, 2011.



© Lantmäteriet 2011. Medgivande M112374.
Godkänd ur sekretessynpunkt för spridning 2011-10-25.



DESTRUCTION AT BOFORS TEST CENTER

THREE SITES:

THE BURNING SITE "RÖSIMMEN"

THE DETONATION SITE "TOLSBODA"

THE DESTRUCTION KILN "KULAN"

LARGEST VOLUMES AT "RÖSIMMEN",
MOSTLY ANE

LIMITED TO THE TIME OF THE YEAR WHEN
THERE IS A REASONABLY LOW RISK OF
FOREST FIRES

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THE BURNING SITE “RÖSIMMEN”

OPEN BURNING OF:

EXPLOSIVES INCLUDING ANE

EXPLOSIVES WASTE

EXPLOSIVES CONTAMINATED WASTE



EXPLOSIVES AND ANE ARE
BURNED IN TEN AREAS
SURROUNDED BY BERMS

RISK AREA: 600 METRES (RADIUS)

2,000 TONNES/YEAR

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THE DESTRUCTION KILN "KULAN"

DESTRUCTION OF:

SMALL ARMS AMMUNITION

CIVILIAN DETONATORS

FUZES

ETC.

THROUGH HEATING TO IGNITION/INITIATION
IN AN ELECTRICALLY HEATED KILN

THE ITEMS ARE PACKED IN BAGS AND
PLACED ON A CONVEYOR WHICH FEEDS THE
KILN FROM THE TOP

EVERYTHING IS THEN OPERATED REMOTELY
FROM A PROTECTED CONTROL ROOM

RECYCLING OF METAL IS POSSIBLE

RISK AREA: 50 – 100 METRES (RADIUS)

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THE DETONATION SITE “TOLSBODA”

OPEN DETONATION OF:

DETONATORS

MILITARY AMMUNITION THAT CANNOT BE TAKEN CARE OF
BY CONVENTIONAL DEMIL

ITEMS THAT CANNOT BE DESTROYED BY OPEN BURNING
OR IN THE DESTRUCTION KILN

DESTRUCTION IN CAMPAIGNS ONE TO TWO TIMES PER
YEAR

MAXIMUM 10 KG PER DETONATION (INCLUDING SUPPORT
EXPLOSIVES E.G. FLAKED TNT)

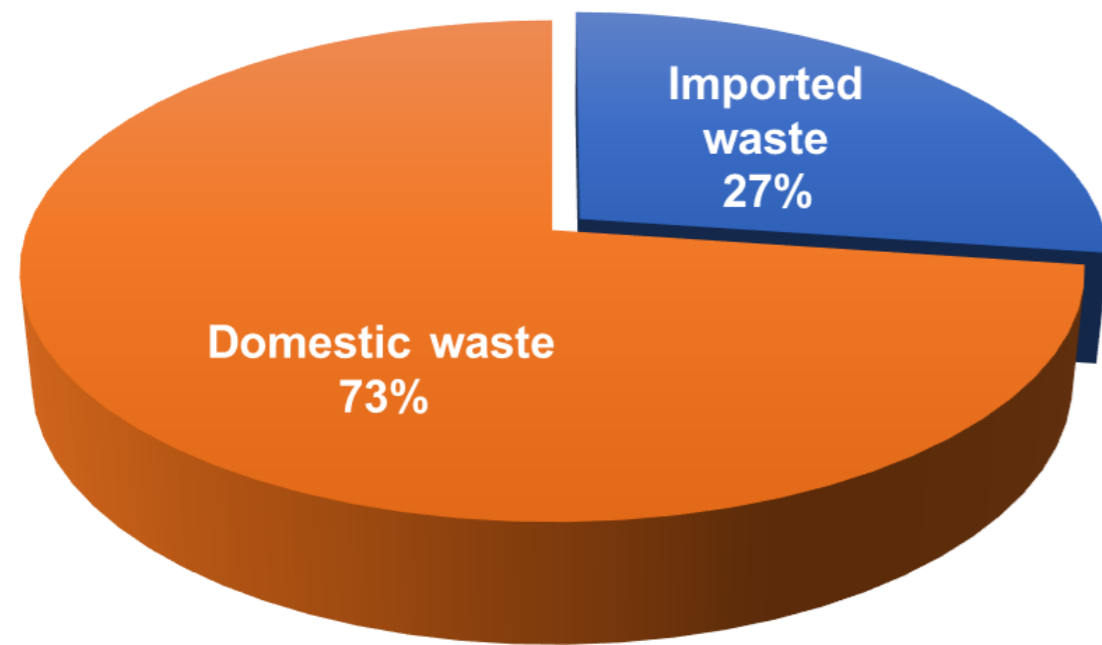
RISK AREA: 500 – 1000 METRES (RADIUS)

60 TONNES/YEAR (INCLUDING SUPPORT EXPLOSIVES)

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DESTRUCTION AT BOFORS TEST CENTER 2022

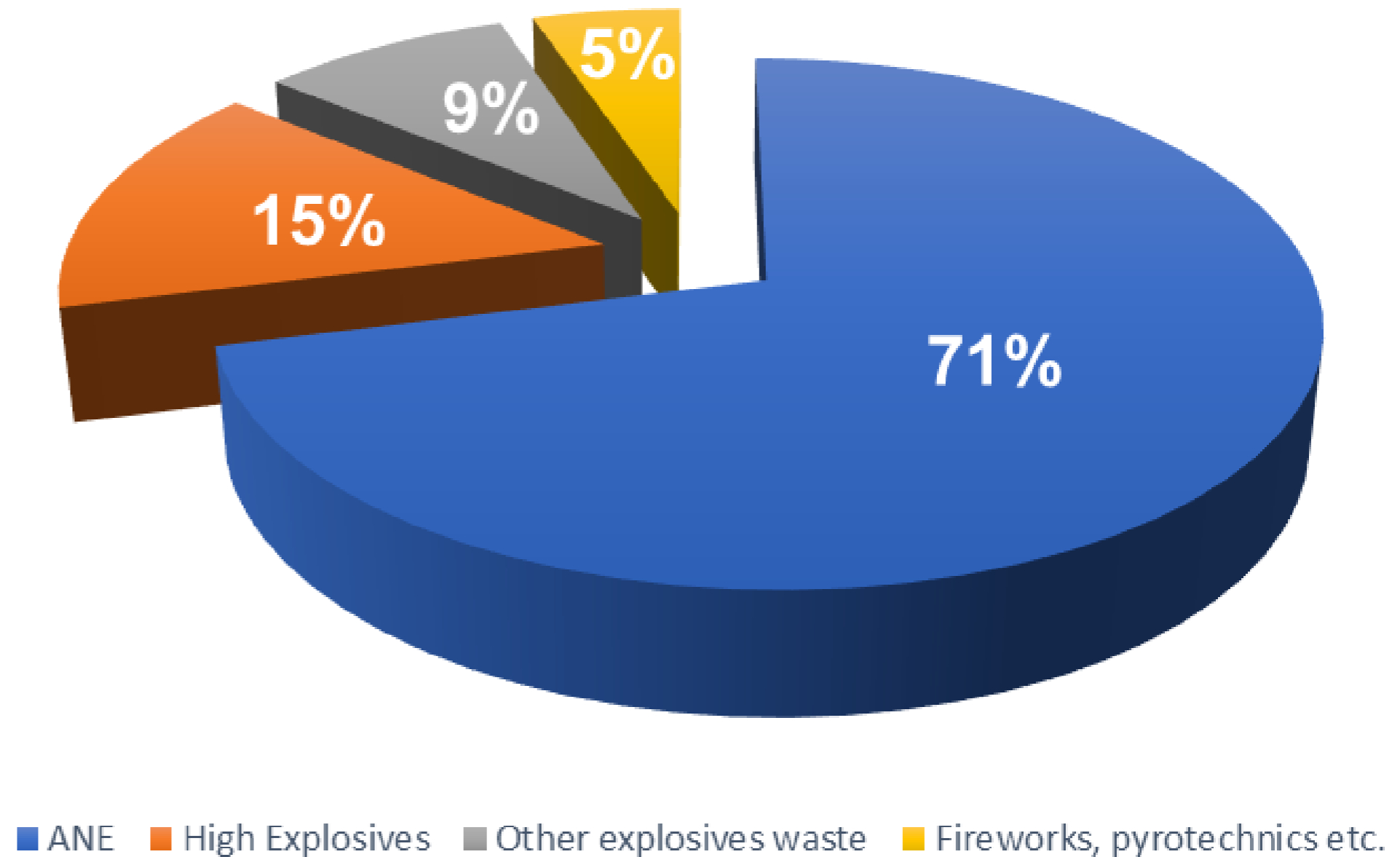
BY OPEN BURNING: 750.2 TONNES



BY OPEN DETONATION: 5.4 TONNES

IN THE DESTRUCTION KILN: 0.6 TONNES

IN TOTAL:



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OPEN BURNING AND OPEN DETONATION?

WTF!

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EFFECTS ON HEALTH AND ENVIRONMENT

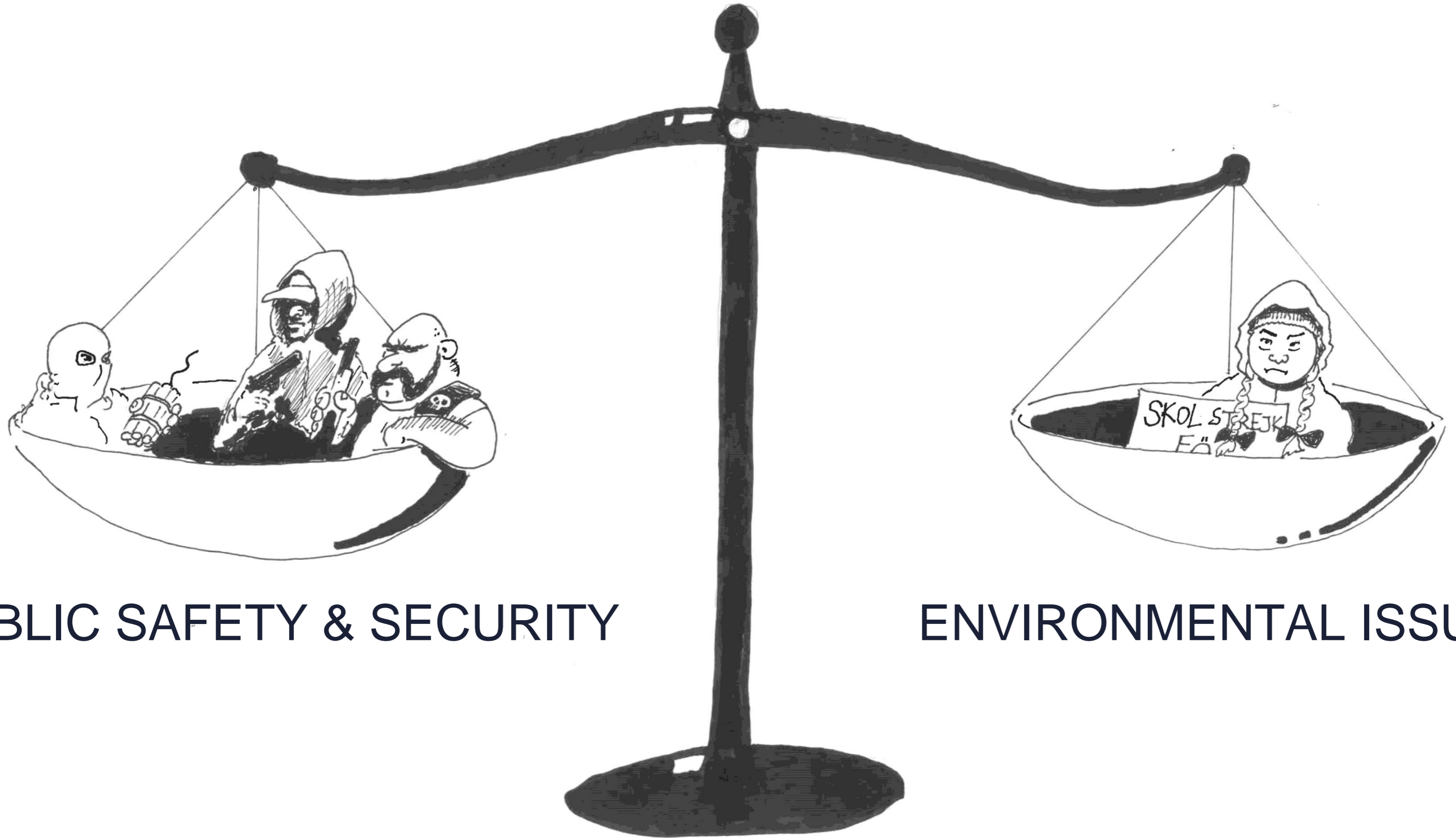
NOISE: ACCEPTABLE LEVELS

AIR: PAH, Pb, Cu, Zn – HIGHER VALUES LOCALLY BUT OVERALL LOW RISK

GROUND AND WATER: RDX, HMX – ACCEPTABLE LEVELS

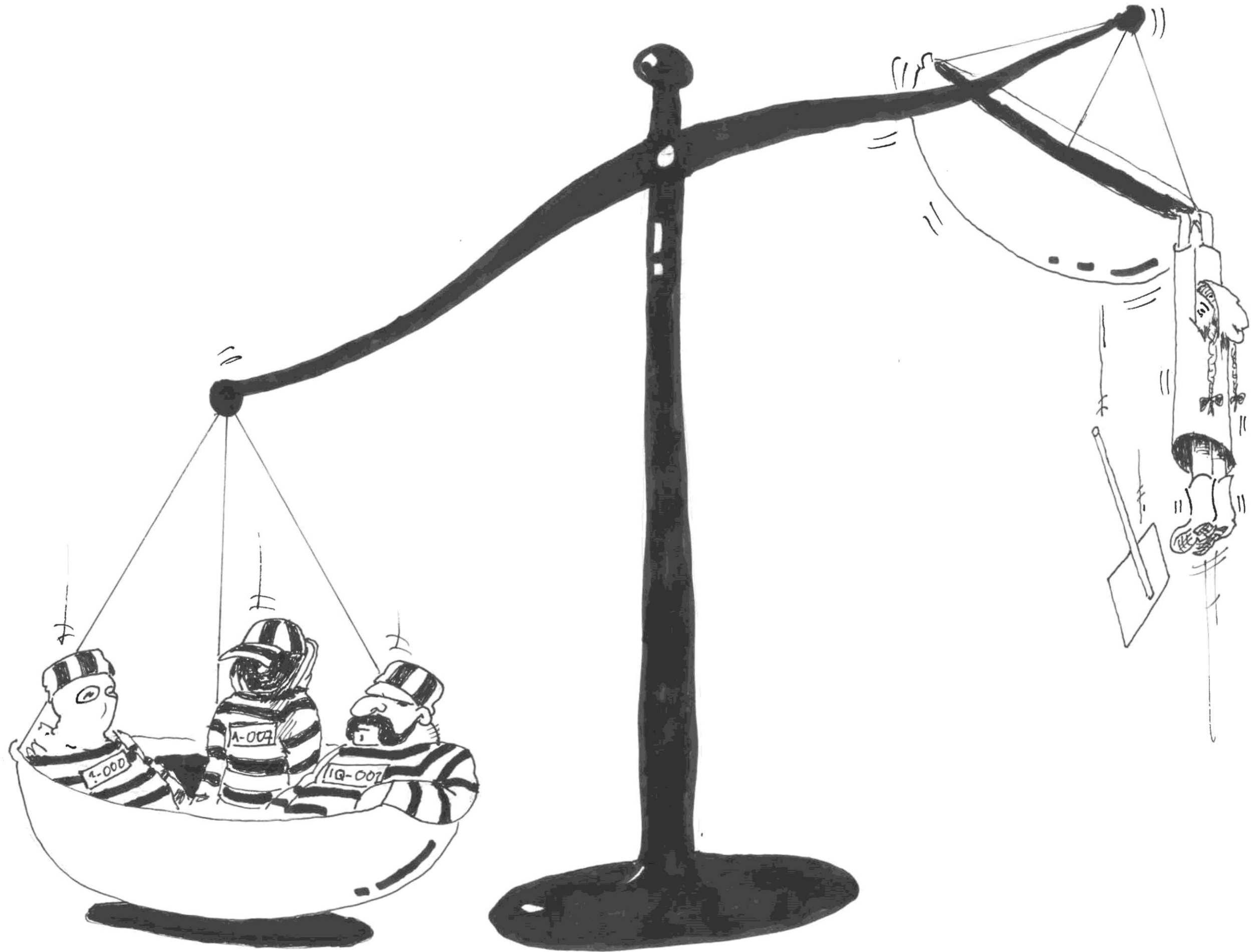
ASH: SHALL BE COLLECTED AND SENT TO AN AUTHORISED COMPANY AS LANDFILL

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PUBLIC SAFETY & SECURITY

ENVIRONMENTAL ISSUES





AND THERE ARE ALSO OTHER THINGS THAN CRIMINAL ACTIVITIES TO WORRY ABOUT...

TO STORE OLD EXPLOSIVES IN UNSUITABLE CONDITIONS IS ALWAYS A VERY BAD IDEA

REMEMBER:

CYPRUS, 2011
11 KILLED
62 INJURED
COSTS: 2.83 BILLION USD

BEIRUT, 2020
218 KILLED
7,000 INJURED
COSTS: 15 BILLION USD

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A NUMBER OF PERMISSIONS FROM SWEDISH AUTHORITIES ARE REQUIRED

- PERMISSION FOR HANDLING OF EXPLOSIVES
- PERMISSION FOR DESTRUCTION OF EXPLOSIVES
- ENVIRONMENTAL PERMISSION FOR DESTRUCTION OF EXPLOSIVES
 - Open burning: only allowed for explosives waste that, for safety reasons, cannot be destroyed in any other way. Only certain waste that is in accordance with a list of approved waste set up by the responsible authorities are allowed to destroy using open burning.
 - Detonation of waste shall only be used for ammunition waste and explosives waste that cannot, in a safe way, be taken care of by demilitarization and/or burning.
 - Detonation of ammunition waste and explosives waste shall as far as possible be conducted in a destruction kiln or similar and only for certain waste that is in accordance with a list of approved waste set up by the responsible authorities.
 - Open detonation: shall be limited as far as possible and is only allowed for explosives waste that cannot, for technical reasons, be destroyed in a destruction kiln.
 - Open detonation shall only be conducted day time (07.00-18.00) on normal working days.

BETWEEN STATES

BASEL CONVENTION – Controlling transboundary movements of hazardous waste and their disposal

“Parties to the Basel Convention have the overall obligation to ensure that transboundary movements of hazardous and other wastes are minimized and that any such movement is conducted in a manner which will protect human health and the environment. In addition to these general obligations, the Convention provides that transboundary movements can only take place if certain conditions are met and if they are in accordance with certain procedures.”

<http://www.basel.int/Implementation/Controllingtransboundarymovements/Overview/tabid/4325/Default.aspx>

WITHIN THE EU:

REGULATION (EC) No 1013/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

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QUESTIONS BEFORE DESTRUCTION BY BURNING



ARE THERE ANY RISKS OF DETONATION?

HOW WELL DOES THIS PRODUCT BURN?

IS SUPPORT FUEL REQUIRED? IF SO; WHAT KIND, HOW MUCH AND HOW TO IGNITE IT?

WHAT IS THE SIZE OF THE RISK AREA REQUIRED?

HOW LONG TIME AFTER IGNITION DOES THE RISK AREA NEED TO BE ACTIVE?

WILL THERE BE RESIDUES? IF SO; HOW SHALL THEY BE TAKEN CARE OF?

ARE THERE ANY ENVIRONMENTAL RISKS?

ON "STANDARD" ITEMS FOR DESTRUCTION ALL THESE QUESTIONS ARE ANALYSED AND HANDLED BY INTERNAL INSTRUCTIONS

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ALWAYS REMEMBER



THERE ARE LIMITATIONS ON WHAT CAN BE DESTROYED

THERE ARE LIMITATIONS ON THE AMOUNT THAT CAN BE DESTROYED SIMULTANOUSLY

THE DESTRUCTION METHOD DEPENDS ON:

- TYPE OF WASTE
- AMOUNT
- PACKAGING

WASTE THAT SHALL BE DESTROYED BY OPEN BURNING MUST NOT CONTAIN ANYTHING THAT COULD BE INITIATED TO DETONATION

SOMETIMES SHIT HAPPENS

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UNEXPECTED DETONATION

DESTRUCTION OF 4,000 KG OF “AMMONIUM NITRATE EMULSION...”, (DIVISION 5.1!), BY OPEN BURNING IN ACCORDANCE WITH NORMAL PROCEDURES

EVERYTHING PACKED IN IBC TANKS AS USUAL

SOME UNKNOWN TRASH (THAT SHOULD NOT HAVE BEEN THERE) INSIDE OF AN IBC WAS INITIATED TO DETONATION

CRATER DIAMETER: APPROXIMATELY 15 METRES

A VERY BRIEF STUDY OF THE SIZE OF THE CRATER SUGGESTS THAT THE DETONATION CAUSED DAMAGES COMPARABLE TO A DETONATION OF APPROXIMATELY 250 KG TNT

HUMAN ERROR?

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UNEXPECTED DELIVERY

???

WAS MARKED AND SHIPPED AS “ETHYL METHYL KETONE...”

WEIGHED APPROXIMATELY 160 KG

WAS AT FIRST (BEFORE OPENING) HANDLED AS
EXPLOSIVES CONTAMINATED SOLVENT

WHAT WOULD YOU DO WHEN YOU HAVE A BARREL OF
SOMETHING THAT COULD BE ANYTHING (INCLUDING HIGH
EXPLOSIVES) AND YOU DO NOT HAVE A CLUE OF ITS
SENSITIVITY?

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THIS IS HOW WE DID IT

CHEMICAL ANALYSIS OF SAMPLES FROM THE SURFACE OF THE ITEM

THE ANALYSIS SHOWED LOW CONTENTS OF HIGH EXPLOSIVES

WERE THESE SAMPLES REPRESENTATIVE? COULD IT BE SOMETHING ELSE IN ITS CORE?

WAS FINALLY BURNED ON SITE WITH EXTRA SAFETY PRECAUTIONS



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CIVILIAN DETONATORS

DELIVERY OF “EXPLOSIVE, BLASTING, TYPE E” UN 0241 IN TOTALLY TWENTY PLASTIC BARRELS

THIS DELIVERY ALSO CONTAINED TWO IDENTICAL PLASTIC BARRELS, MARKED UN 0241 AS ALL BARRELS WERE, BUT FILLED WITH APPROXIMATELY 3,000 CIVILIAN DETONATORS

INSPECTION AT THE BURNING SITE WAS ONLY MADE ON A LIMITED NUMBER OF BARRELS – NOT ALL

EVERYTHING WAS HANDELED BY OPEN BURNING AS NORMAL FOR UN 0241

A PARTIAL DETONATION OCCURRED AND A LARGE NUMBER OF UNREACTED DETONATORS WERE SPREAD ALL OVER THE AREA

THE BURNING SITE HAD TO BE CLOSED FOR THREE MONTHS

STEP ONE: FIFTEEN PEOPLE, ONE DAY, RECOVERY BY HAND, AMBULANCE AT SITE

STEP TWO: BURNING OF PROPELLANT ETC. AT SITE IN ORDER TO IGNITE POSSIBLE REMAINING DETONATORS, THIS WAS PERFORMED SEVERAL TIMES

TOTAL COSTS: APPROXIMATELY 75,000 GBP

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THINGS LIKE THIS HAPPENS FROM TIME TO TIME DUE TO:

LACK OF KNOWLEDGE

LACK OF COMMUNICATION

NEGLIGENCE

ETC.

“IT’S JUST TRASH...” AND IS THEREFORE UNFORTUNATELY TREATED AS TRASH AND NOT AS EXPLOSIVES

THIS IS WHY WE ARE USING THE METHODS DESCRIBED, ARE CONTINUALLY IMPROVING THEM AND ARE OPERATING IN AREAS FAR AWAY FROM PUBLIC

SAFETY FIRST!

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DO NOT WAIT!

WE WILL TAKE CARE OF THAT LATER...
OUR CASHFLOW IS NOT QUITE GOOD RIGHT NOW...
WE CAN KEEP THIS FOR A WHILE...
AS LONG AS WE KEEP IT HERE IT WILL NOT BE DANGEROUS...
WE HAVE TO ANALYSE WHAT TO DO...
WE WILL "CLOSE" THIS AREA INSTEAD...
EXPENSIVE, DANGEROUS, COMPLICATED, ETC.

TEN YEARS LATER:

WHAT THE BL**DY H*LL IS THIS?



DO NOT BE THAT ORGANISATION!

SEND YOUR EXPLOSIVES WASTE FOR DESTRUCTION IMMEDIATELY!

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ACKNOWLEDGEMENTS

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JULIA TOREHEIM



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QUESTIONS?



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**THANKS FOR YOUR KIND
ATTENTION!**

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