WM3 and Waste Classification

Presentation to the Joint Northern Contaminated Land Fora

10th July 2018

- Dr. Ian Bishop
- One Touch Data Ltd
- ibishop@onetouchdata.com
- Tel: 01628 771731

- www.hazwasteonline.com

New version WM3

- WM3 version 1.1 was released 26th June 2018
- Mainly modified to reflect Regulation (EU) 2017/997
- Which describes new rules for assessment of HP14 Ecotoxic
- Have to apply the H400 series of hazard statements
  - [old money = R50/R53 type risk phrases]
- New set of equations - such as Eq. 3
  - $100 \times \Sigma c\ H410 + 10 \times \Sigma c\ H411 + \Sigma c\ H412 + \Sigma c\ H413 \geq 25\ \%$
- Good news is that the substance specific thresholds are not being replaced by M factors
  - So PAH: benzo[a]anthracene is no longer hazardous at 25 mg/kg

The overlooked? requirement

Phase I/II/III

Design

Tender

Award

Build

- Waste classification is rarely requested by the developer
- Why?
- For the planning and design, the developer may only need:
  - Phase I ESA - includes review previous use of site
  - Phase II - Site characterisation – boreholes, test pits,
    - Soil samples & laboratory test data
    - Human health risk assessment
  - Geotechnical assessment
  - Phase III - Remedial investigation and/or opinion
  - Phase IV - Remediation system design and clean-up
- Typically, consultants are **not** paid to undertake a hazardous waste classification (HWC) of soils for the purposes of waste disposal

onetouchdata

The issues

Phase I/II/III

Design

Tender

Award

Build

- If consultant recommends HWC, developer doesn't want to pay – (because they don't have to)
  - Sometimes a consultant will provide a preliminary classification of the available Phase II data – but it is not likely to be fit for (the final) purpose
- Then, the design is completed, planning granted
- Tender package issued
- Now tenderers have to take on the risk for disposal of any surplus/not suitable for use soils (CL:AIRE CoP)
  - But all they have is the SI, which was completed for a different purpose, and
  - there is no time to collect and test extra soil samples
- If they were to do more, the cost (risk) is borne by them

And following tender award

- A different team on the ground
  - different expertise and priorities:
    - contract, delivery deadline, budget
- And groundwork contractor mixes non-hazardous soils with hazardous soils
- Surplus left in a stockpile awaiting removal
- At disposal time, waste classifier only has
  - the Phase II report, and/or
  - Lab tests from samples taken from the stockpile
- Waste producer is breaking the law ? by effectively mixing (diluting) hazardous soils with non-hazardous soils
- ….

Existing Case Law – contaminated soils

- Court of Justice of the European Union - Case C-1/03
  - See 2012 DEFRA document on .gov.uk
- Van de Walle 2004 – A Texaco branded service station had suffered from an accidental leak of hydrocarbons into the surrounding soils
- Texaco were being sued by local government to recover costs for remediating oil contaminated soils beneath an adjacent building
- CJEU ruling found that
  - Hydrocarbons which are unintentionally spilled and cause soil and groundwater contamination are waste within the meaning of the Directive
  - *The same is true for soil contaminated by hydro-carbons, even if it has not been excavated.*

- Waste Directive 75/442/EEC
- Waste Framework Directive 2006/12/EC
- revised WFD 2008/98/EC

onetouchdata

However, does newer 2008 legislation trump this case law?

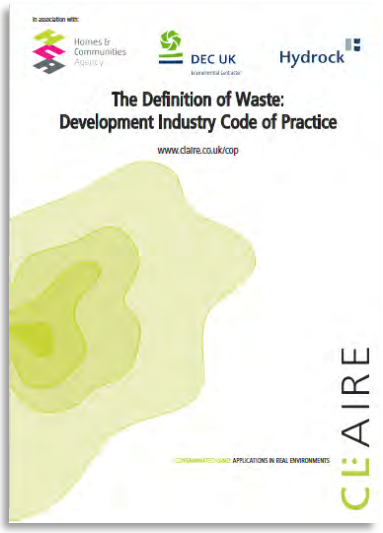
2008/98/EC

- Revised Waste Framework Directive's Article 2 says
  - 1. The following shall be excluded from the scope of this Directive:
    - (b) land (in situ) including unexcavated contaminated soil and buildings permanently connected with land;
    - (c) uncontaminated soil and other naturally occurring material excavated in the course of construction activities where it is certain that the material will be used for the purposes of construction in its natural state on the site from which it was excavated;

CL:AIRE

- *So question is when does an excavated soil actually become a waste?*
  - *rWFD defines waste as 'any substance or object which the holder discards or intends or is required to discard'*
- keywords here are (un)contaminated & excavated

CL:AIRE CoP



- Also uses the words contaminated and uncontaminated
- Uses a human health risk based approach
- Requires a Materials Management Plan
- Defines categories of "materials **within** the ground" including:
  5. Material that is not capable of being used… and requires recovery or disposal off site as waste
  6. Material that is surplus to requirements and requires recovery or disposal off site as waste

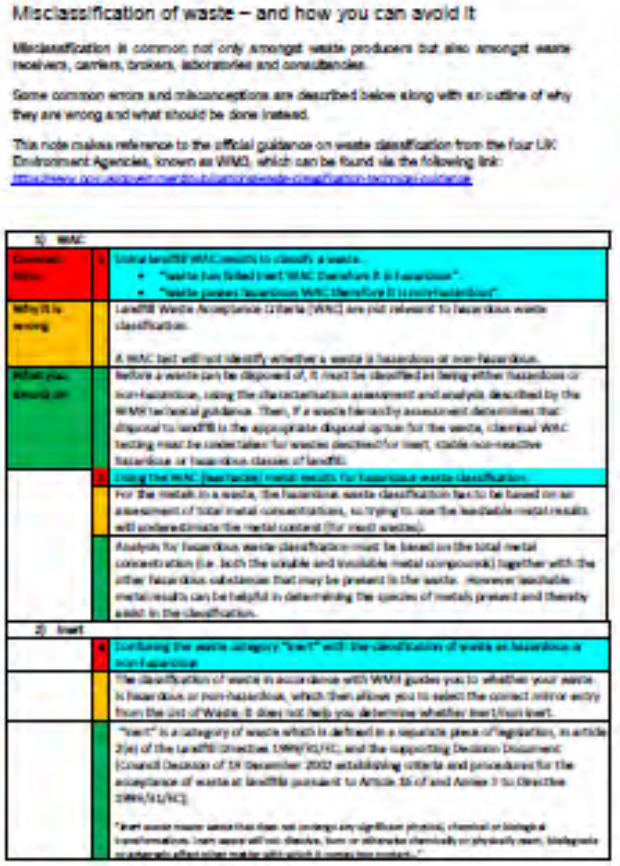
- It's not specifically stated but part of this **categorisation** should also include a WM3 based waste classification

- It's clear that hazardous soils should be kept separate from other categories of soils

A better solution? (at pre tender stage)

- The spatial extent of contaminated soils and existing samples should be integrated with the final design.
- Categorise the different soil types that may be;
  - Subject to excavation under CL:AIRE CoP
  - And/or declared as surplus (contaminated and not)
- For each waste stream/category, a classifier, competent in waste classification (WM3), should then:
  - Define a suitable sampling & testing plan
  - Have further samples collected and analysed
  - Undertake a formal waste classification
- The waste classification report, sampling plan, limitations & recommendations should then be included in the tender package

Misclassification of Waste



Misclassification of waste – and how you can avoid it

Misclassification is common not only amongst waste producers but also amongst waste receivers, carriers, brokers, laboratories and consultancies.

Some common errors and misconceptions are described below along with an outline of why they are wrong and what should be done instead.

This note makes reference to the official guidance on waste classification from the four UK Environment Agencies, known as WM3, which can be found via the following link:

1) WAC

Common misconception	✗	Using landfill WAC results to classify a waste. • "waste has failed inert WAC therefore it is hazardous". • "waste passes hazardous WAC therefore it is non-hazardous"
Why it is wrong		Landfill Waste Acceptance Criteria (WAC) are not relevant to hazardous waste classification. A WAC test will not identify whether a waste is hazardous or non-hazardous.
What you should do		Before a waste can be disposed of, it must be classified as being either hazardous or non-hazardous, using the characterisation assessment and analysis described by the WM3 technical guidance. Then, if a waste hierarchy assessment determines that disposal to landfill is the appropriate disposal option for the waste, chemical WAC testing must be undertaken for waste destined for inert, stable non-reactive hazardous or hazardous classes of landfill.
	✗	Using the WAC leachable metal results for hazardous waste classification.
		For the metals in a waste, the hazardous waste classification has to be based on an assessment of total metal concentrations, so trying to use the leachable metal results will underestimate the metal content (for most wastes).
		Analysis for hazardous waste classification must be based on the total metal concentration (i.e. both the soluble and insoluble metal compounds) together with the other hazardous substances that may be present in the waste. However leachable metal results can be helpful in determining the species of metals present and thereby assist in the classification.

2) Inert

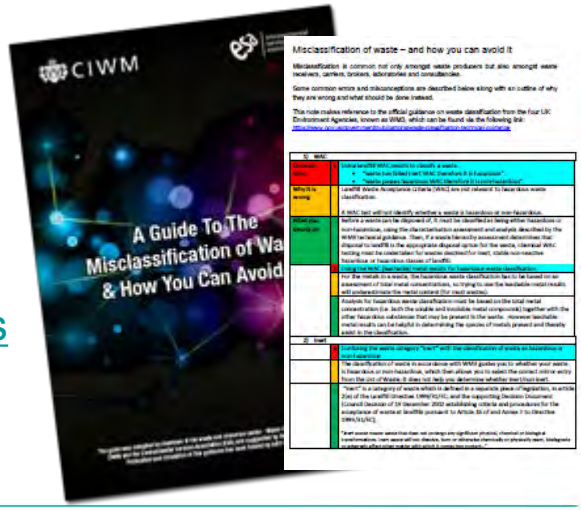
	✗	Confusing the waste category "inert" with the classification of waste as hazardous or non-hazardous.
		The classification of waste in accordance with WM3 guides you to whether your waste is hazardous or non-hazardous, which then allows you to select the correct mirror entry from the List of Wastes. It does not help you determine whether inert/non-inert.
		"Inert" is a category of waste which is defined in a separate piece of legislation, in article 2(e) of the Landfill Directive 1999/31/EC, and the supporting Decision Document (Council Decision of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC). "Inert waste means waste that does not undergo any significant physical, chemical or biological transformations. Inert waste will not dissolve, burn or otherwise chemically or physically react, biodegrade or adversely affect other matter with which it comes into contact."

onetouchdata

Misclassification – Helping to raise the bar

- We do a lot of pro bono work
  - Giving free advice to both our customers and potential customers
  - Reviewing data and classifications
  - Supporting people where one side or the other may be doing it wrong
  - Have advised the Agency/HSE about errors in the CLP data sets, and
    - Areas of the guidance where things might be going awry/not clear
  - Publicising information between different stakeholders

- Actively supporting bodies like ESA, CIWM and CIRIA
  - ESA: Misclassification of waste
  - www.hazwasteonline.com/marketing/Resources/brochures



1. “I am using WAC data to classify my waste”

Eluate Analysis
Arsenic
Barium
Cadmium
Chromium
Copper
Mercury
Molybdenum
Nickel
Lead
Antimony
Selenium
Zinc
Chloride
Fluoride
Sulphate as SO4
Total Dissolved Solids
Phenol
Dissolved Organic Carbon

- **Wrong - You cannot use WAC** for waste classification
- Amongst other determinads, WAC analysis only measures the soluble metal compounds of 12 specific metals
- WAC ignores all of the insoluble metal compounds
- WAC also ignores most other hazardous substances that may be in your waste
- Example showing error:
- Fly ash waste
  - WAC results: zinc <0.5 mg/kg
  - Solid results: zinc 2,620 mg/kg

Think of it this way

- WAC data tells you what is in the water, while
- Classification needs to know what is in the tea bag

onetouchdata

2a “Waste classification tells you whether your waste is hazardous, non-hazardous *or Inert*”

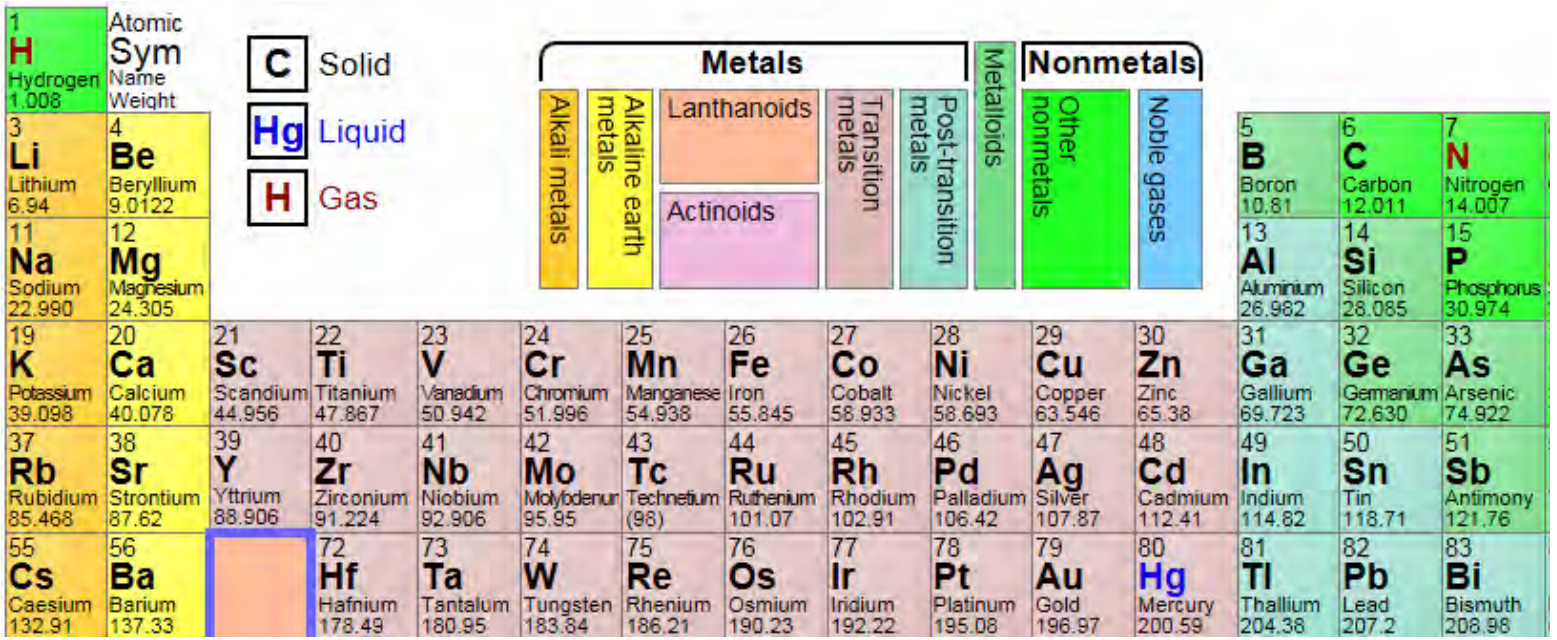
- **Incorrect** – Waste classification does not also classify your waste as “Inert”
  - Inert is a category of landfill only (Landfill Directive)
    - *Article 2 (e) “inert waste means waste that does not undergo any significant physical, chemical or biological transformations. Inert waste will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter…”*
  - Inert waste is effectively a subset of non-hazardous
  - Remember you only need WAC if a previously classified waste is also destined for a landfill

2b “My waste has failed inert WAC, therefore it’s hazardous”

- **Incorrect**, it typically means that it’s just failed to meet one or more of the waste acceptance criteria for that class of landfill
- Often because of :
  - Loss on Ignition (LOI), or
  - Total Organic Content (TOC)
- neither of which are substances

3. “If all the metals add up to less than 2,500 mg/kg it’s none hazardous”

- **Incorrect** – You cannot use “Rules of thumb”
- & many reasons why this example is totally, totally wrong
  - Including one basic question “Which metals am I meant to add up…?”



onetouchdata

4.1 The “Rule of Thumb” list …

- “I check the amount of a metal I have against a [mental]* [paper]* list”
- **Incorrect** - for a number of reasons including:
  1. we have to use the concentration of a **metal compound**, not the concentration of just the metal (there are a few exceptions..)
- For example:

Hazard properties

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1A; H350i "May cause cancer by inhalation."

Because of determinand:

nickel sulfate: (compound conc.: 0.1%)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number							
1		nickel { nickel sulfate }				380 mg/kg	2.637	1001.94 mg/kg	0.1 %		
		028-009-00-5	232-104-9	7786-81-4							
								Total:	0.1 %		

onetouchdata

You cannot use the metal concentrations as is

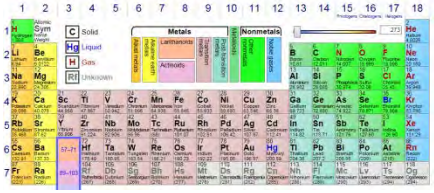
Sample ID	TD1
Sample Type	Soil
Date of Receipt	14/11/2018
Antimony	15
Arsenic	<0.5
Barium	7
Cadmium	0.5
Chromium	1219.0
Cobalt	<0.5
Copper	12
Iron	9595
Lead	<5
Manganese	51
Mercury	<0.1
Nickel	380
Zinc	160

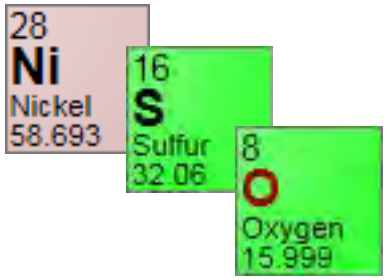
- The lab report only gives you the total metal concentrations for each metal, e.g.
  - copper, nickel, zinc
- In waste classification, you have to use the concentration of metal compounds – for example:
  - copper oxide, nickel sulphate, zinc oxide
- So if a lab reports 380 mg/kg of nickel (Ni), and
- you suspect it is in the form of nickel sulphate ($NiSO_4$):
  - You have to work out the Conversion Factor to convert x mg of nickel to XX mg if nickel sulphate

onetouchdata

How do you work out this Conversion Factor?

www.ptable.com





#	Determinand	Unit	Sample 1
1	Depth	m	
2	moisture {no correction}	%	
3	antimony {antimony trioxide}	mg/kg	
4	arsenic {arsenic trioxide}	mg/kg	
5	beryllium {beryllium oxide}	mg/kg	
6	boron {diboron trioxide; boric oxide}	mg/kg	
7	cadmium {cadmium oxide}	mg/kg	
8	chromium in chromium(III) compounds {	mg/kg	
9	chromium in chromium(VI) compounds {ch	mg/kg	
10	copper { dicopper oxide; copper (I) oxid	mg/kg	
11	lead {lead chromate}	mg/kg	
12	manganese {manganese sulphate}	mg/kg	
13	mercury {mercury dichloride}	mg/kg	
14	molybdenum {molybdenum(VI) oxide}	mg/kg	
15	nickel {nickel sulfate}	mg/kg	380
16	selenium {selenium compounds with the ex	mg/kg	
17	zinc {zinc chromate}	mg/kg	

- Lab reports 380mg/kg of nickel (Ni), and you suspect it is in the form of nickel sulphate : $NiSO_4$
- From the periodic table, record the molecular weights of Ni 58.693 S 32.06 and O 15.999
- Molecular weight = 58.69+32.06+(4x15.99) = 154.71 g/mol
- To calculate the conversion factor:
  - divide the molecular weight by amount of Ni
    - 154.71/(1 x 58.69) = 2.64
- So 380mg/kg of nickel x 2.64 equates to 1003mg/kg of $NiSO_4$
  - Which is hazardous by HP7 carcinogenic

onetouchdata

4.2 Another key reason why you cannot use individual concentrations

HP4
HP6
HP8
HP14

2. Many substances have **additive** hazard properties.
   - This means that you have to consider the concentrations of all the other substances in the waste with the same hazard properties - and do some sums
- On its own, a given substance may not be hazardous but due to the presence of other substances in the same waste, it is hazardous
- For example

Job name: Additivity example

Details | Determinands \ Samples | Tests | Documents | Too

#	Determinand	Unit	Sample 1
1	Depth	m	
2	moisture {no correction}	%	
3	dicopper chloride trihydroxide	mg/kg	1250
4	zinc oxide	mg/kg	

Job name: Additivity example

Details | Determinands \ Samples | Tests | Documents | Tool

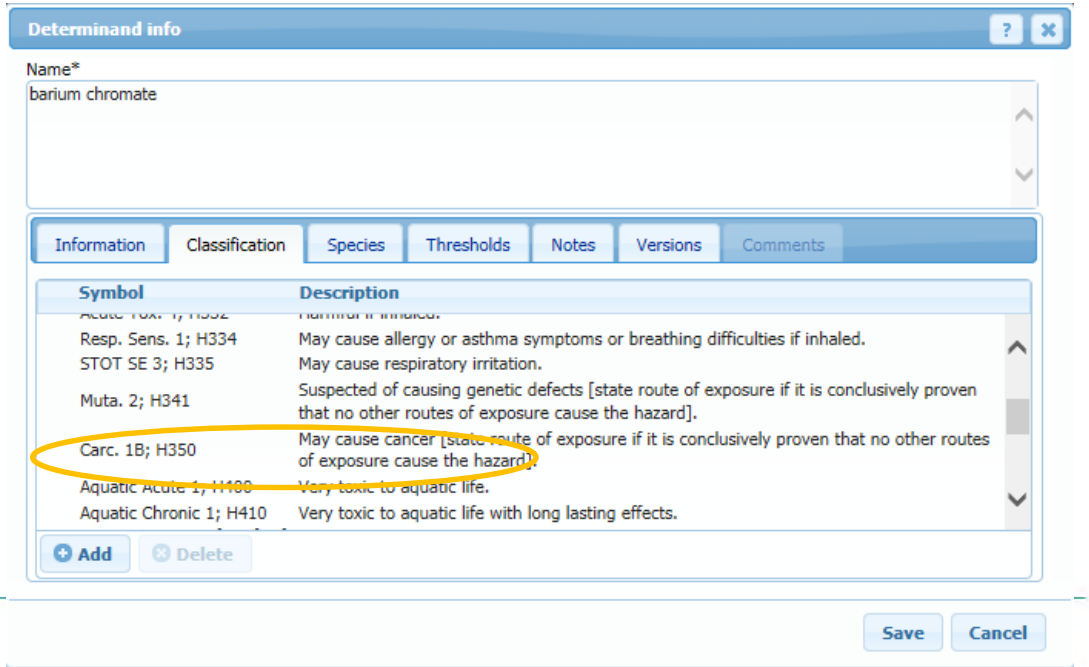
#	Determinand	Unit	Sample 1
1	Depth	m	
2	moisture {no correction}	%	
3	dicopper chloride trihydroxide	mg/kg	1250
4	zinc oxide	mg/kg	1250

onetouchdata

5. Substance is not in the CLP

- "I have 30,000 mg/kg of a substance - but it's not in Table 3 of the CLP, so it can't be hazardous – Therefore I can ignore it.."
- **Incorrect** - you have to research missing substances
  - Table 3 only contains approximately 4,500 substances
  - European Chemicals Agency (ECHA) is researching and adding more each year - but it takes time

- For example:
- barium chromate
  - is not in the CLP
- But all chromates are hazardous at 1000 mg/kg (0.1%)

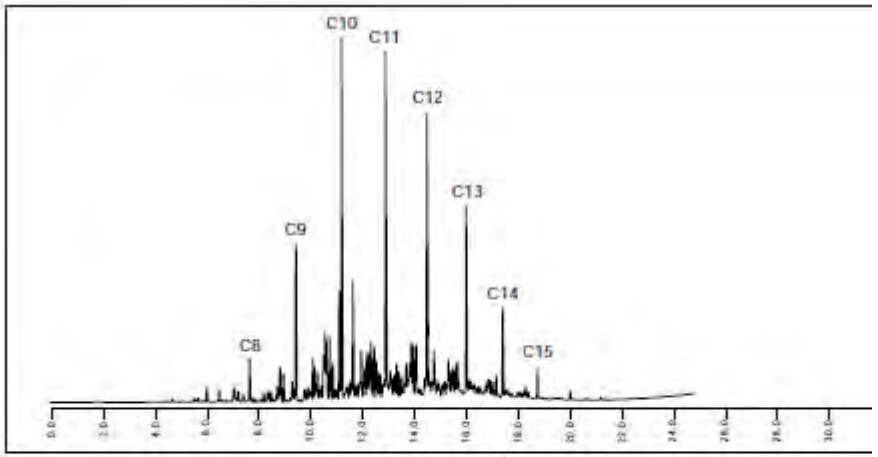


6a. TPH / EPH and the carbon bands

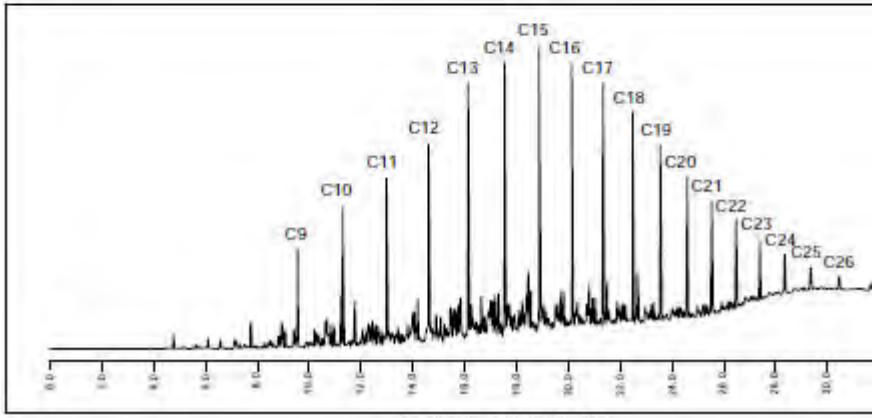
- "I added up the concentrations for C10-C25; the Diesel Range Organics and checked it against the diesel threshold" (10,000 mg/kg)
- **Incorrect** - you cannot cherry pick carbon bands
- You have to use the Total TPH concentration

Aliphatic	Aromatic
>C5-C6	>C6-C7
>C6-C8	>C7-C8
>C8-C10	>C8-C10
>C10-C12	>C10-C12
>C12-C16	>C12-C16
>C16-C21	>C16-C21
>C21-C35	>C21-C35
>C35-C44	>C35-C44

Both oils are in DRO range: C10-C25 but neither are diesel



Analysis of Kerosene



Analysis of Light Oil

onetouchdata

6b. TPH CWG

TPH CWG	
Aliphatics	
>C5-C6	1.5
>C6-C8	5.4
>C8-C10	<1.0
>C10-C12	<0.2
>C12-C16	<4
>C16-C21	118
>C21-C35	502
Total aliphatics C5-35	627
Aromatics	
>C5-EC7	<1.0
>EC7-EC8	<1.0
>EC8-EC10	<1.0
>EC10-EC12	<0.2
>EC12-EC16	9
>EC16-EC21	39
>EC21-EC35	256
Total aromatics C5-35	304
Total aliphatics and aromatics (C5-35)	931

- I can use the TPH-CWG results from the phase II report as long as I use the sum of all the aromatics and aliphatics
- **OK but be Aware** – For unknown oils, WM3 requires us to use determinand:
  - TPH(C6-C40) Petroleum Group
    - 6 to 40 carbons
- But
  - TPH-CWG is often reported from C5 to C35
- So we are missing C36 to C40
- & therefore underestimating the TPH concentration

onetouchdata

7. “Standard Analysis Test Suite”

1. Antimony
2. Arsenic
3. Cadmium
4. Chromium
5. Copper
6. Mercury
7. Nickel
8. Lead
9. Selenium
10. Zinc

- If your company uses a “Standard Analysis Test Suite” for contaminated land that lists a set of substances that you should test for.
  - e.g. 10 metals, TPH, PAHs, BTEX, pH
- This is not best practice for waste classification
- Better to call it a “**Minimum Analysis Test Suite**” as
  - the name automatically makes the user consider whether there may be other/extra substances that should be tested for, and therefore
  - that they should review the site history/Phase I report

onetouchdata

7. “Standard Analysis Test Suite”

Standard Suite

1. Antimony
2. Arsenic
3. Cadmium
4. Chromium
5. Copper
6. Mercury
7. Nickel
8. Lead
9. Selenium
10. Zinc

- For example
  - The Phase I desk study finds that there was a factory on the site that used to manufacture fireworks
  - We have our “Standard metal suite”
- Homework on the metal salts commonly used in firework manufacture finds:
  - **copper** chloride (blue fireworks).
  - **barium** chloride (green fireworks)
  - **calcium** chloride (orange fireworks)
  - **sodium** nitrate (yellow fireworks)
  - **strontium** carbonate (red fireworks)

onetouchdata

Classification Package

The Waste Classification Package

- A classification package should contain the evidence necessary to justify your classification, including;

- The description of the waste / process(s) that created the waste
- A sampling plan
- Detailed classification report, including
  - Names of the all metal species used and the justification for their selection
  - Justification for any non CLP substances
- Contain an original (complete) copy of the lab data
- Contain other supporting documentation
  - e.g. SDS, chromatograms, flammability test, phase I/II reports

Description of Waste

1 Set up Details and List of Waste code(s) EXAMPLE 3

1 **Location of waste source site**

UnderSea Power Station, London

1.1 **Description of Industry/producer business type that produced the waste**

Redevelopment of derilict industrial building used to generate electricity by burning coal

1.2 **Description of the specific process, sub-process and/or activity that created the waste**

Waste created during the excavation of soils for development of basement complex.

1.3 **Description of the waste**

Single waste stream ☐ Mixed waste stream [X] tick which applies

List and describe (all) waste stream(s)

1) Soil and stones/made ground
2) Fragments of asbestos
3) Lumps concrete

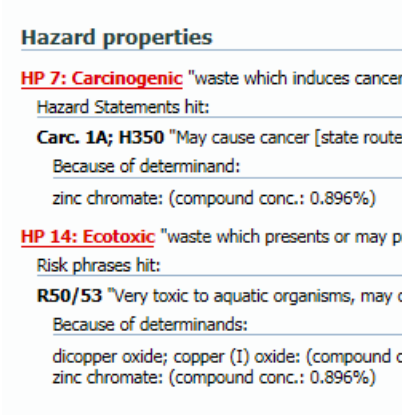
1.4 **Identify the relevent List of Waste (LoW) code or codes, based on the industry and process that created the waste: Chapters 1-12 or 17-20; 13 to 15; 16 as per WM3**

Code or mirror entry codes 1	17 05 03*	17 05 04	If Mirror Entry complete
Code or mirror entry codes 2	17 06 01 *	17 06 04	Sheet 2
Code or mirror entry codes 3		17 01 01	

1.5 **Name of entity identifying the code and for whom**

	Company Name	Chain [3]
Waste Producer [1]	Olympic Developments	1
Haulier	We'll shift anything Ltd	2
Broker		
Waste Receiver	East Tiltern Hazardous Landfill	3
Consultant /Agent [2]		
Subcontractor [2]		
Other [2]		

HazWasteOnline™



- HazWasteOnline was introduced in 2010
- Cloud-based software for the chemical classification of waste
- Includes all 4500+ harmonised substances - Table 3 of CLP
  - & 100+ of substances that we have added
  - CLP substances updated by ATPs as they are published
  - Classifiers can also add their own user-defined substances
- Includes all 20 chapters from the List of Waste
- Uses rule-based classification engine(s)

- Import data directly from approved labs: the .hwol file
- Highlights all the hazardous substances
- Optional corrections for moisture and TPH
- Acid/alkali correction to help manage extreme pH
- Industry standard PDF report
- Auditable, transparent

onetouchdata

The Job

HazWasteOnline Professional and Packages Edition

Back to Manager | Add Sample... | Save | Import | Attach Document... | Delete... | Classify All | Export

Job name: Example Classification

Details | Determinands \ Samples | Tests | Documents | Tools | Packages

#	Determinand	Unit	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
1	Depth	m										
2	moisture {dry weight correction}	%	11	13	15.4	15.5	9	12	17.2	11.5	23.2	13
3	antimony {antimony trioxide}	mg/kg	9	4	9	9	12	10	10	7	8	40
4	arsenic {arsenic trioxide}	mg/kg	106.9	70.8	220.4	174.5	274.7	257.4	195	132.8	129.9	840.7
5	beryllium {beryllium oxide}	mg/kg										
6	boron {diboron trioxide; boric oxide}	mg/kg	0.8	0.7	0.9	0.8	0.9	1.5	1.1	2.3	1.9	1.3
7	cadmium {cadmium oxide}	mg/kg	3.9	1.4	2.2	1.6	4.9	4.1	2.6	4	6.4	4.9
8	chromium in chromium(III) compounds {	mg/kg	8.7	39.1	30.8	50	15	15.7	45.1	16.6	46.9	22
9	chromium in chromium(VI) compounds {ch	mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
10	copper { copper sulphate pentahydrate}	mg/kg	631	89	173	191	311	362	194	311	257	516
11	lead { lead compounds with the exceptic	mg/kg	610	270	511	426	805	802	497	609	555	1693
12	manganese {manganese sulphate}	mg/kg										
13	mercury {mercury dichloride}	mg/kg	0.2	0.2	0.8	0.8	0.9	1.1	1	0.9	0.9	4.2
14	molybdenum {molybdenum(VI) oxide}	mg/kg	7.3	4.1	4.3	5.6	4.4	5.2	5.6	3.8	6	10.4
15	nickel {nickel sulfate}	mg/kg	20.9	21.7	36.5	36.5	31.8	30.2	27.3	28.6	34.4	64.3
16	selenium {selenium compounds with the ex	mg/kg	6	2	3	3	2	2	3	2	3	8
17	zinc {zinc sulphate}	mg/kg	1254	307	474	531	1224	1150	714	1134	1576	1416
18	TPH (C6 to C40) petroleum group	mg/kg	2241	983	1193	1033	1039	701	1037	934	1472	2484
19	confirm TPH has NOT arisen from diesel or	n/a	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
20	tert-butyl methyl ether; MTBE; 2-methoxy-2	mg/kg	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
21	benzene	mg/kg	<0.003	0.021	0.015	0.01	0.009	0.033	0.019	0.013	0.004	0.008
22	toluene	mg/kg	0.007	0.033	0.019	0.017	0.01	0.033	0.021	0.01	0.005	0.008
23	ethylbenzene	mg/kg	<0.003	0.008	0.007	0.006	0.003	0.007	0.007	0.005	<0.003	<0.003
24	xylene	mg/kg	0.007	0.038	0.057	0.04	0.02	0.068	0.053	0.024	0.016	0.022
25	cyanides { salts of hydrogen cyanide with	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	2	<0.5	6.2	2.4	<0.5
26	pH	pH	10.07	10.77	9.16	9.28	9.59	9.09	8.9	9.03	9.5	7.91
27	naphthalene	mg/kg	0.546	1.945	3.08	1.912	4.78	6.52	8.12	1.28	0.56	7.29
28	acenaphthylene	mg/kg	0.15	0.23	0.6	0.6	0.91	0.36	0.87	0.28	0.14	3.18

onetouchdata

The PDF Report

onetouchdata

Waste Classification Report

Job name
HWOL workup of WM3 Example 3 Waste soils

Description/Comments
Waste is a sub soil from a metal plating facility. The data, worst case substances and reasoning were
Site was used for a variety of industrial processes including chemical metal plating. Waste is a solid
Only one sample presented in WM3 example.

Project
WM3 v1 Technical Guidance

Site
Metal Plating Site

Waste Stream Template
EA Example 3. Waste Soil

Classified by
Name: Company:

HP 14: Ecotoxic "waste which presents or may present immediate or delayed risks for one or more sectors of the environment"

Risk phrases hit:

R50/53 "Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment"

Because of determinands:

lead compounds with the exception of those specified elsewhere in this Annex: (Note 1 conc.: 0.162%)
zinc oxide: (compound conc.: 0.18%)

R51/53 "Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment"

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 1.25%)

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

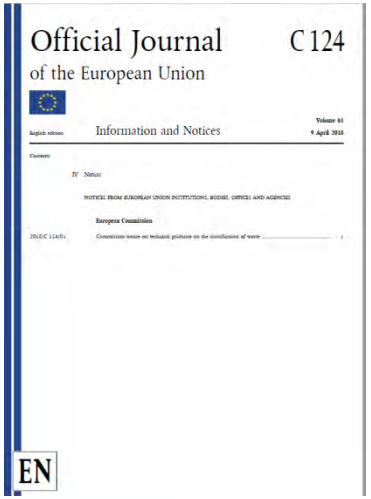
#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	cyanides { ° salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				320 mg/kg	1.88	602.88 mg/kg	0.0603 %		
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		530 mg/kg	1.32	699.772 mg/kg	0.07 %		
3	cadmium { ° cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }	048-001-00-5			1	782 mg/kg		782 mg/kg	0.0782 %		
4	copper { ° dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		400 mg/kg	1.13	450.355 mg/kg	0.045 %		
5	lead { ° lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	1620 mg/kg		1620 mg/kg	0.162 %		
6	nickel { nickel(II) carbonate }	028-010-00-0	222-068-2 [1] 240-408-8 [2]	3333-67-3 [1] 16337-84-1 [2]		297 mg/kg	2.02	600.657 mg/kg	0.0601 %		

Page 2 of 6 9ZJAU-NBC9L-T83DQ www.hazwasteonline.com

onetouchdata

Latest Classification Engines

SEPA Scottish Environment Protection Agency
NIEA Northern Ireland Environment Agency
Cyfoeth Naturiol Cymru Natural Resources Wales
Environment Agency



- Two new classification engines
  - Both entered into force on 5th July 2018
- New UK engine labelled:
  - WM3 1st Edition v1.1
- General mainland Europe engine labelled:
  - Technical Guidance EU/2018/C 124

onetouchdata

Where HazWasteOnline fits in

- Tried and tested software that can assess;
  - any waste stream,
  - any substances and any number of samples,
  - solids, liquids, SDS, and
  - is always up-to-date with the current guidance
- HazWasteOnline creates a level playing field
- So that the classifier can focus on things like:
  - suitable sampling and testing
  - which determinands to test for
  - what type of hydrocarbons might be in their waste
  - which metal compounds are in their waste

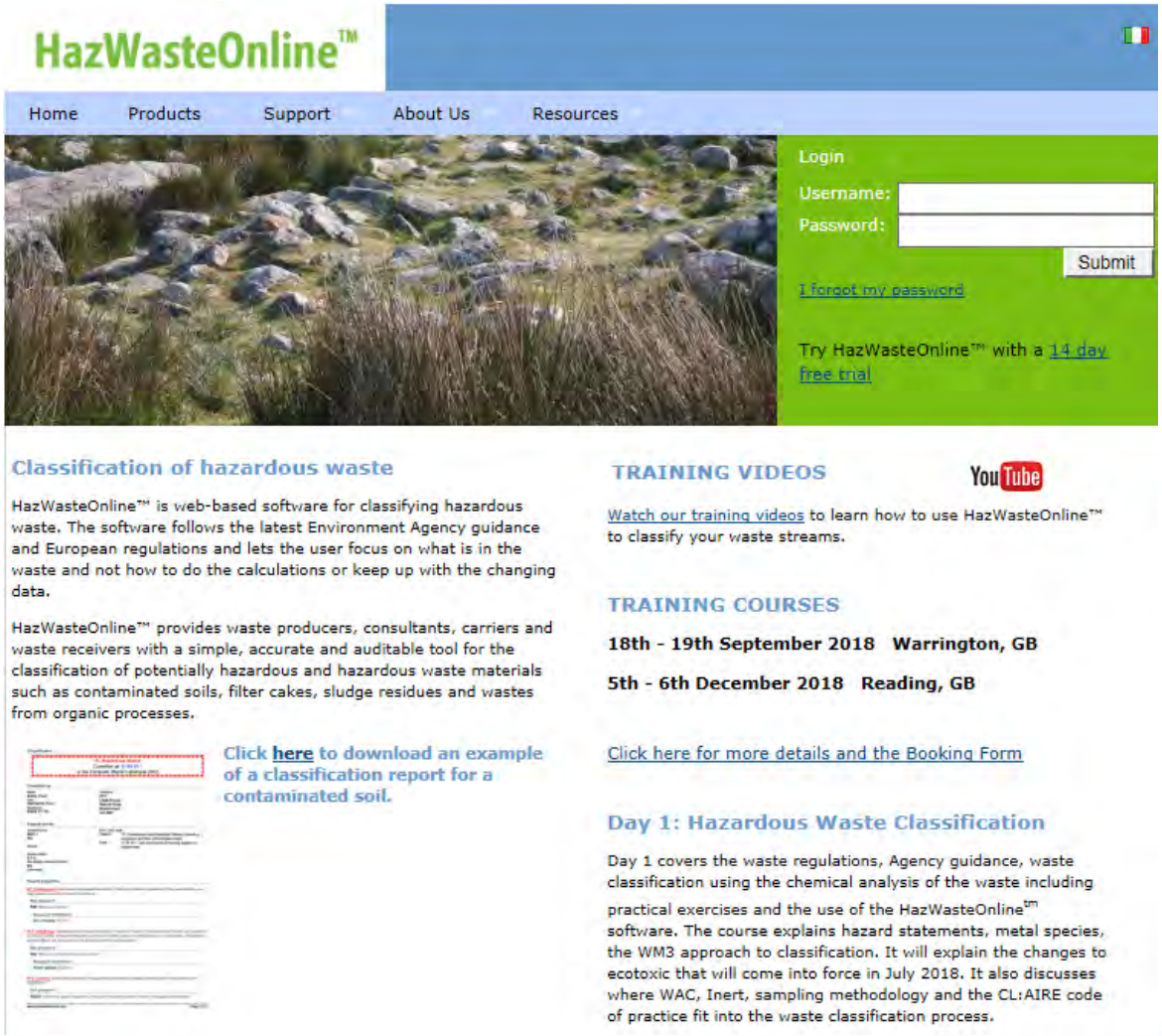
Thank you

Presentation to the Joint Northern Contaminated Land Fora

10th July 2018

- Dr. Ian Bishop
- One Touch Data Ltd
- ibishop@onetouchdata.com
- Tel: +44 (0)1628 771731

- www.hazwasteonline.com



onetouchdata