Waste & Material Reuse:

A Contractor's Case Study

Presented by Mark Field, Project Director

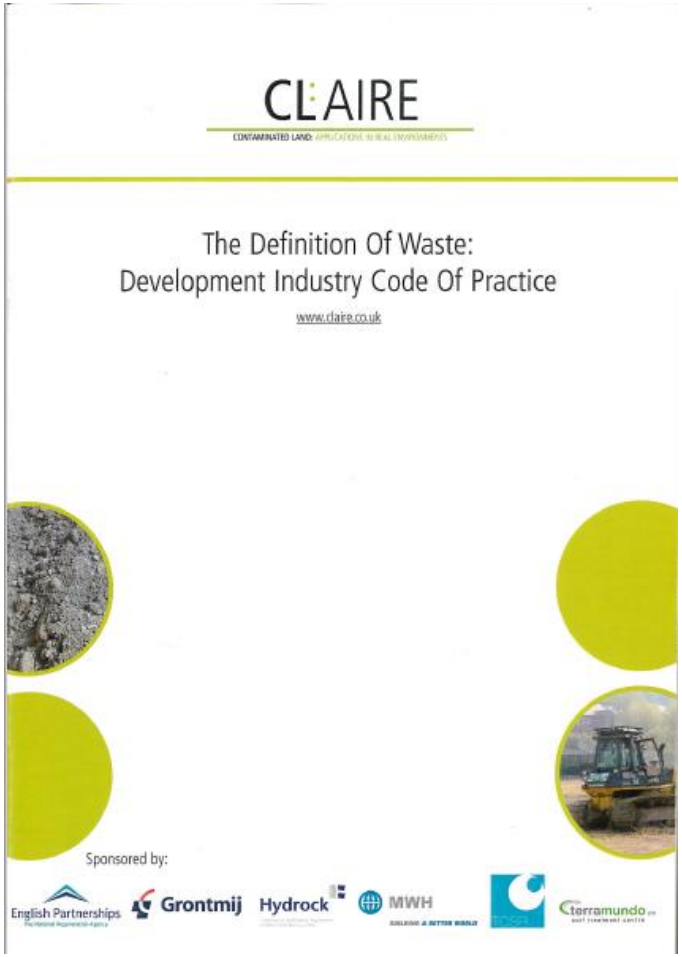
23 May 2019

Vertase FLI

Introduction

- Overview
  - DoWCoP Recap;
  - Other Regulatory Options.
- Case Studies
  - DoWCoP: Re-use on site of Origin;
  - DoWCoP: Direct Transfer;
  - DoWCoP: Hub and Cluster;
  - Waste Recovery Permit;
  - Non-Enforcement Position.
- Summary

DoWCoP Recap



- 2008 CL:AIRE DoWCoP
  - Allows the declassification of excavated soils as being automatically a 'waste';
  - Describes the process to be undertaken to re-use soils without the need for exemptions or permits.
- Requires a number of factors to allow reuse:
  - Doesn't Cause Harm to environment;
  - Certainty of Use;
  - Suitable for Use;
  - Quantity of Material

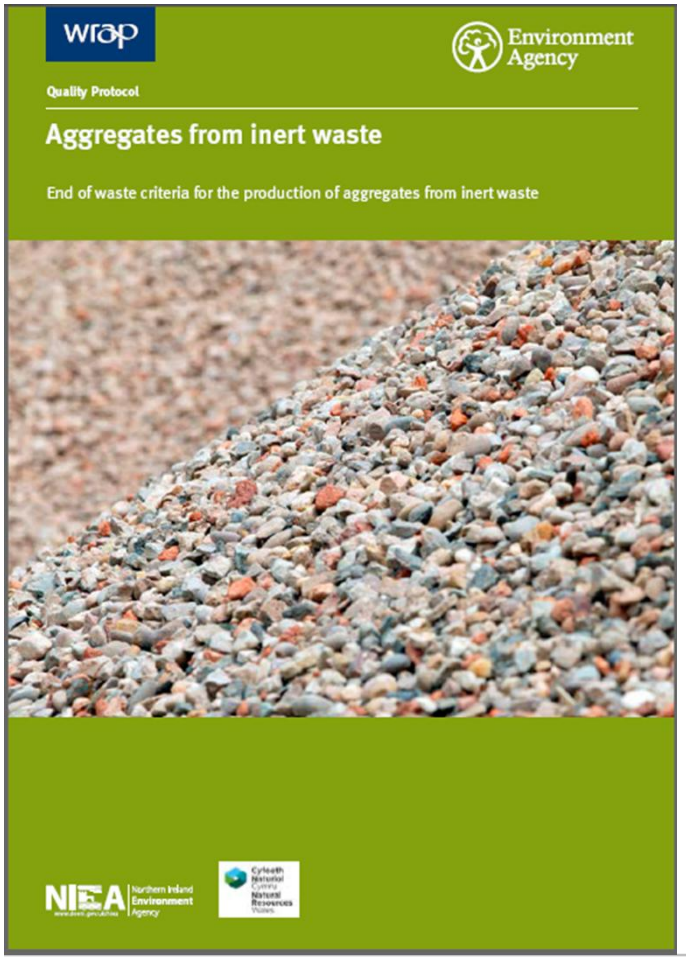
DowCoP Scenarios

- Under DoWCoP four scenarios for re-use
  - Re-use on site of origin;
  - Direct Transfer;
  - Brownfield to Brownfield;
  - Hub and Cluster.

However, DowCoP is not the only Option

- Following the introduction of the Environmental Permitting Regulations three mechanisms exist to allow the re-use / import of a waste material;
  - WRAP Protocol;
  - Exemptions;
  - Other Permitting route (eg waste recovery permits);
  - Local Arrangements (non enforcement position).

WRAP Protocol



- 2004 WRAP Protocol
  - Describes how processed demolition arisings can be removed from regulatory waste regime.
- Requires a demonstration of appropriateness
  - Factory Production Control Manual;
  - Facility Permit (or Exemption);
  - Grading Analysis.

Exemptions / Local Arrangements

- The Environmental Permitting Regulations didn't completely remove exemptions;
- A number of more tightly defined and limited exemptions for re-use of materials;
- The most useful for the development industry is the U1 exemption (Use of Waste in Construction);
  - Allowed the import / re-use of up to 1000 tonnes of soil (excluding hazardous soils).
- Exemption registration is quick and free via an online registration;
- Local arrangements; In some cases, it may be possible to agree a non enforcement position with the EA.

Case Studies

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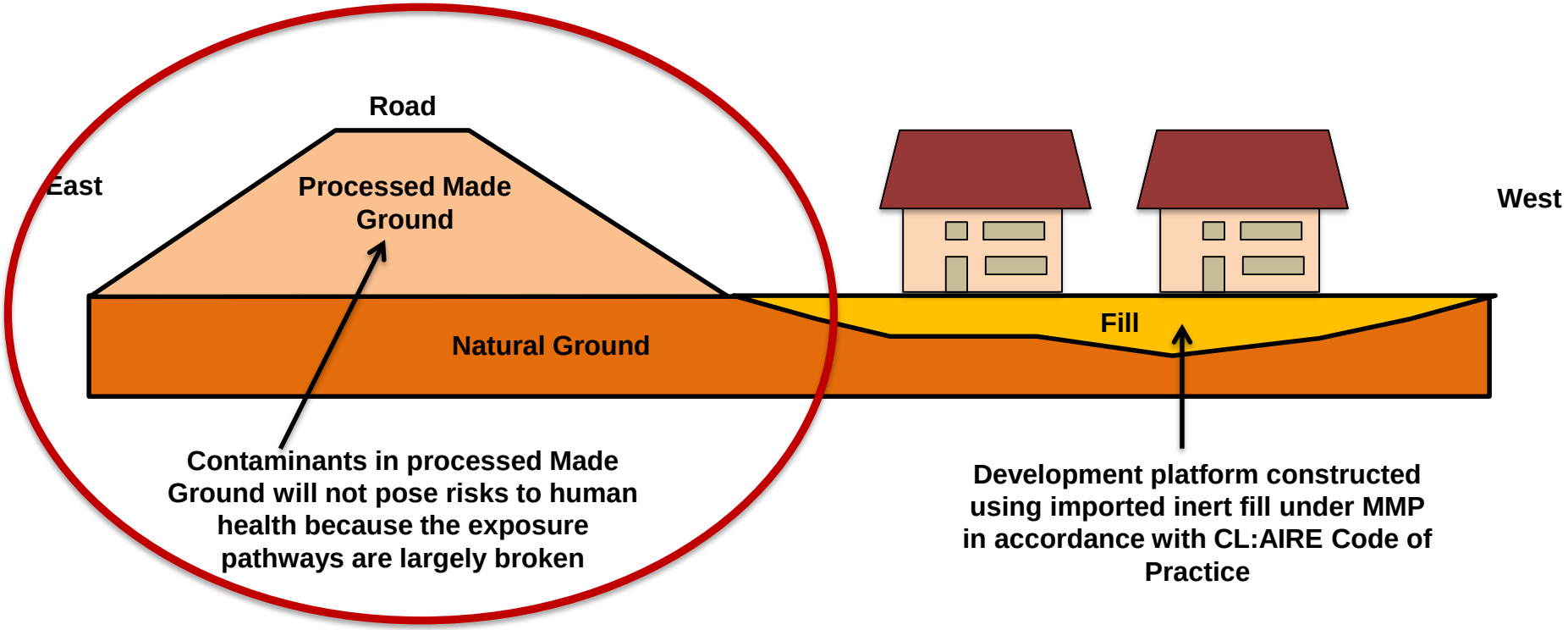
DoWCoP: Re-use on site of origin

- 6.6ha site in Brimington, Chesterfield
- Land adjacent to former Brickworks and Colliery
- Greyhound racing track & stadium (1938 – 1997)
- Track progressively expanded by importing demolition wastes to level sloping ground
- Derelict from 1997 – 2017 and used for illegal fly tipping.
- Need to significantly re-profile made ground on site

Certainty of Use

- Outline planning approval for redevelopment of the Site in August 2015 by Chesterfield Borough Council
  - New access road into Site
  - 120 dwellings
  - Open space
  - Sustainable Urban Drainage
- Conditional to the approval was that the new access road was constructed to 'link road' standard to form start of the Chesterfield-Stavely Regeneration Route

Suitability for Use / No Harm



- Maximises material re-use (by virtue of re-using the Made Ground)
- Works within the initial access constraint (as no imported material is required to construct the embankment)

Need for Material

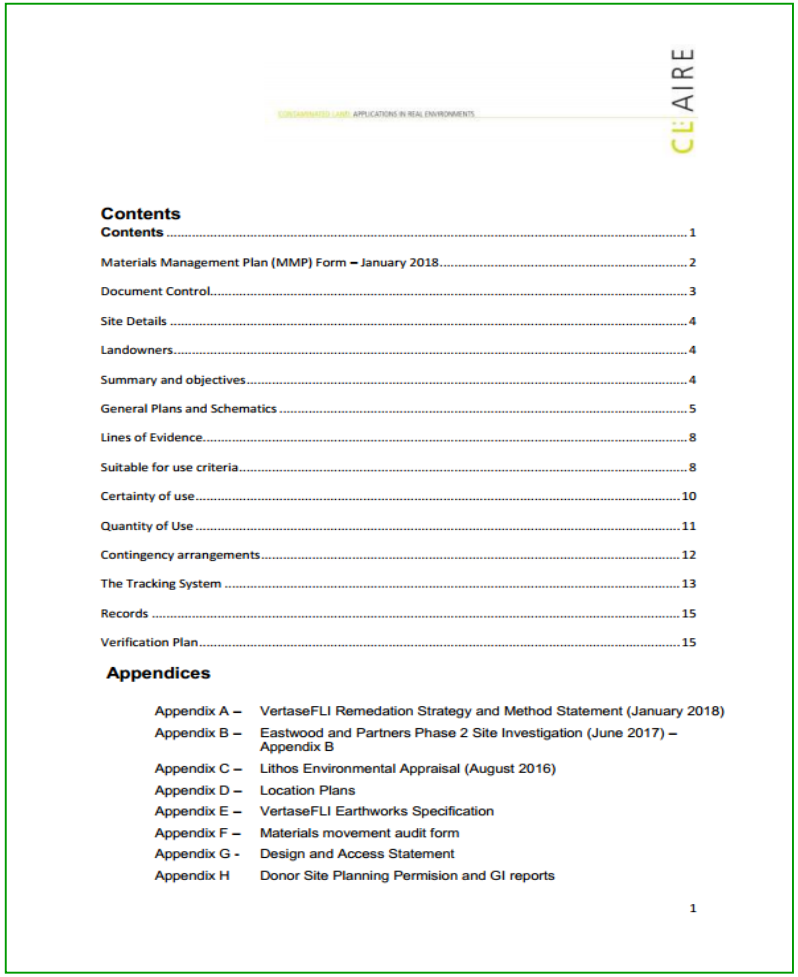
- Volumising the Shortfall (the innovative "Balance Sheet Approach").

	Credit (m^3)	Debit (m^3)	Balance (m^3)
Starting balance			**-9,000**
Topsoil strip		6,600	-15,600
Volume needed to construct embankment		26,000	-41,600
Estimated volume loss due to processing		500	-42,100
Estimated volume loss due to compaction		2,600	-44,700
Estimated Volume gain from drainage arisings	7,000		-37,700
Estimated volume gain from foundation arisings	5,000		-32,700
Volume needed to import	**32,700**		
End balance			**0**

Making sure we didn't 'over import'

MMP Timing

- Produced Prior to works;
- Signed off by QP;
- Amended as new import sources added;
- Verification report produced and submitted upon completion of project;
- Audited by CLAIRE following completion (it does happen).



CLAIRE

Contents

Appendices

1

Direct Transfer

Direct Transfer

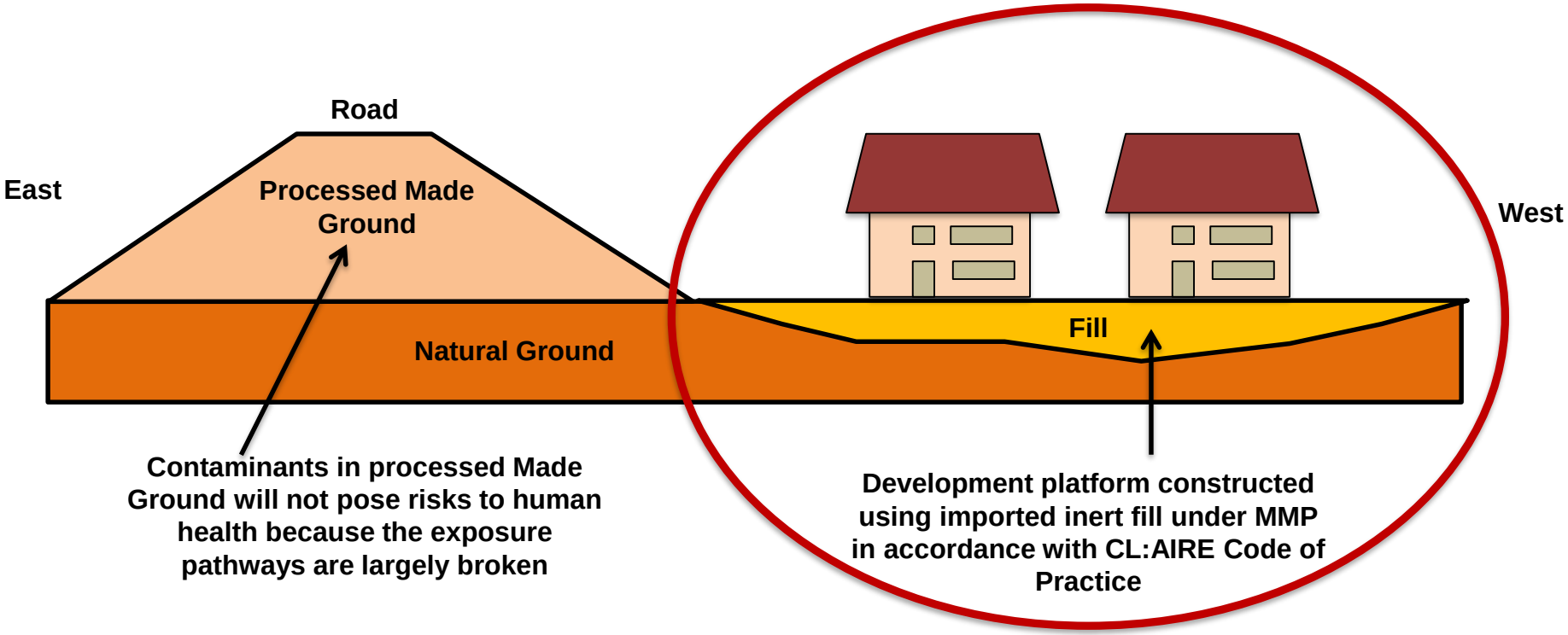
- Allows the direct transfer of clean, naturally occurring soils and minerals from one site to another development site;

- The material must be sourced from:
  - Greenfield sites not subject to past contaminative uses; or
  - Brownfield sites where the natural soils have been extensively characterised and proven to be clean (i.e. contaminants widespread and typical of local conditions).
  -

- Clean naturally occurring soils and minerals includes:
  - Soil, both top and sub-soil;
  - Underlying Geology;
  - Clay, silts and gravels;
  - Made Ground consisting of above materials only.

- The imported soils must not contain substance at concentrations in excess of those identified at the receiving site i.e. no increase in the level of risk once imported to the receiving site.

DoWCoP: Direct Transfer



- Maximises material re-use (by virtue of re-using the Made Ground)
- Works within the initial access constraint (as no imported material is required to construct the embankment)

Suitable for Use

- Design Statements from Import Sites showing material meets site remediation / import targets;
- No treatment required prior to use;
- Cannot introduce a new contaminant to site;
- From a greenfield site.

Need for Materials

- Volumising the Shortfall (the innovative "Balance Sheet Approach")

	Credit (m^3)	Debit (m^3)	Balance (m^3)
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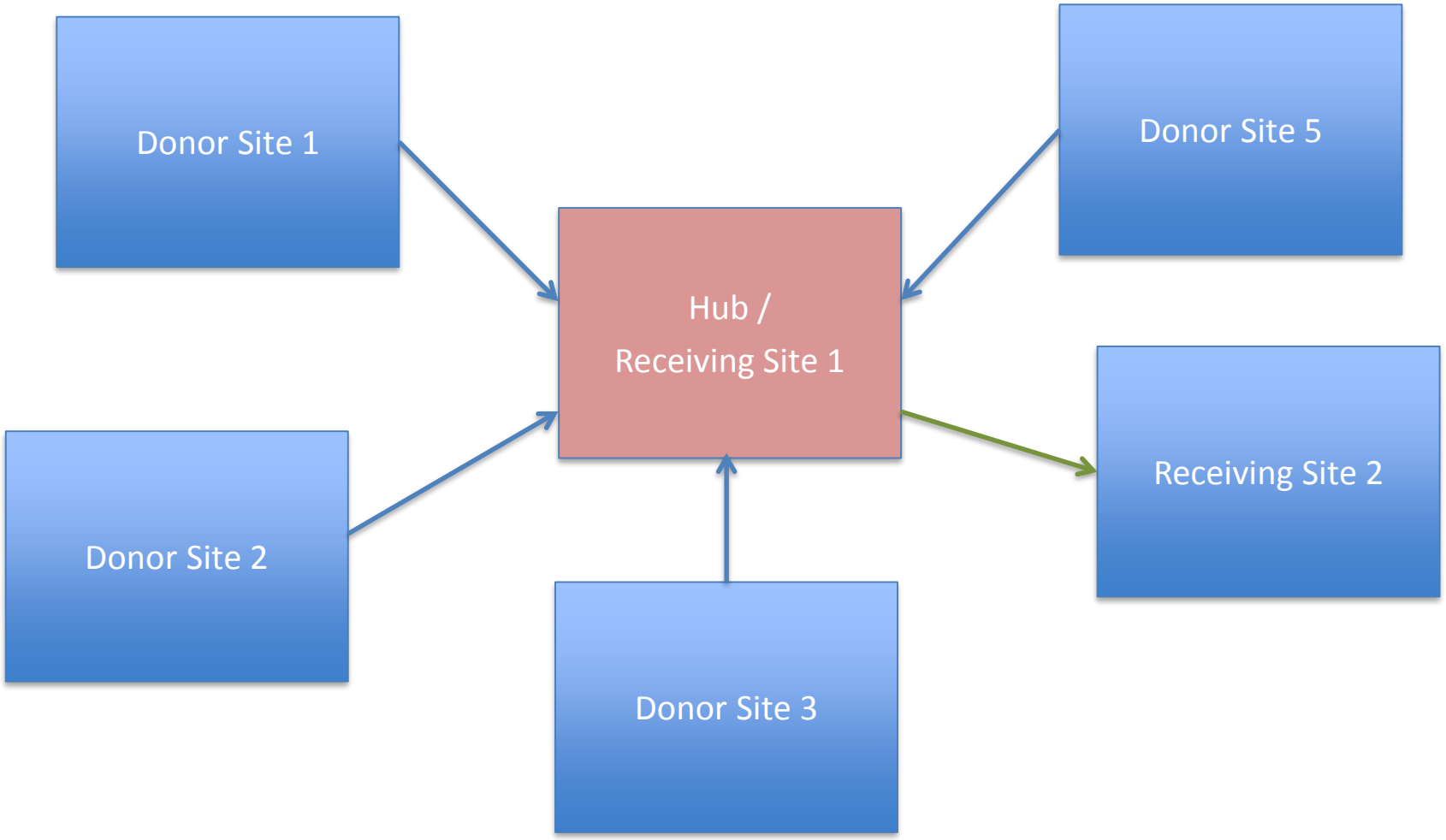
Making sure we didn't 'over import'

Cluster: Multiple Sites



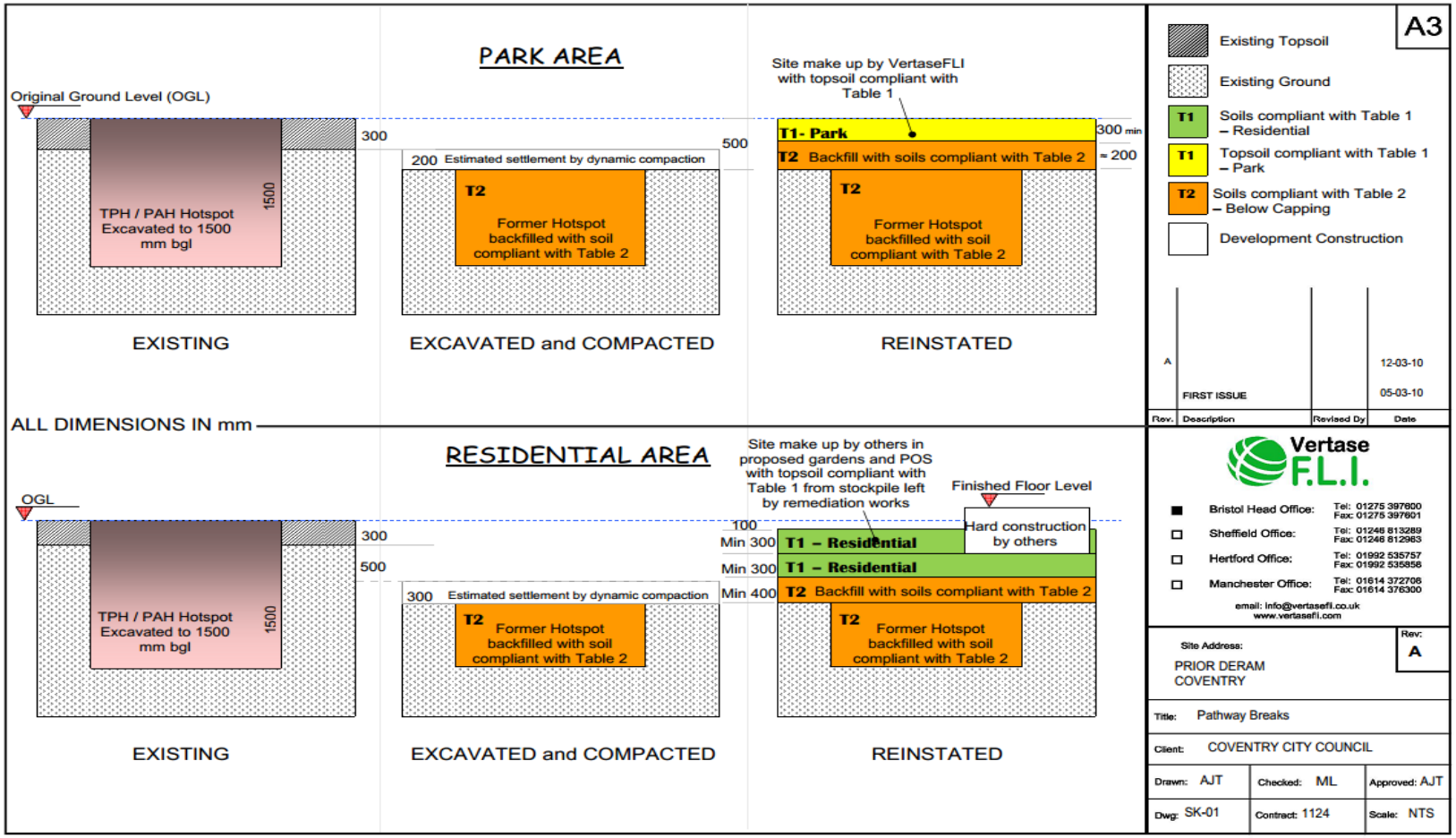
DoWCoP: Hub & Cluster

- Probably the most complex of the scenarios;
- Allows the transfer and reuse of contaminated soils from one site onto any number of other sites subject to strict controls;
- In its simplest form allows brownfield to brownfield transfers excluded from the direct transfer scenario (a two site cluster project). Although more complex multi-site project are also allowed;
- The use of materials at the receiving site must maintain or improve the quality of land at any donor / receiving site:
  - Donor site: Surplus Material
  - Receiving site: Deficit of material
- The site of origin, or receiving site needs to have an appropriate Environmental Permit or waste exemption in place.

The Site

- The council was redeveloping three quarters of an existing park for a residential end use, whilst remediating and returning the remaining quarter to a high quality green space/park area;
- The site was prone to flooding, therefore a significant land raise was required on site. This created a significant materials deficit;
- Due to other works being completed VertaseFLI would have an Environmental Permit on site to allow the processing / treatment of imported soils;
- In collaboration with the council, and the future developers of the residential part of the site, a local development site was identified with surplus materials that could be used;
- DoWCoP Hub and cluster arrangement used to facilitate the movement of soils.

Suitable for Use



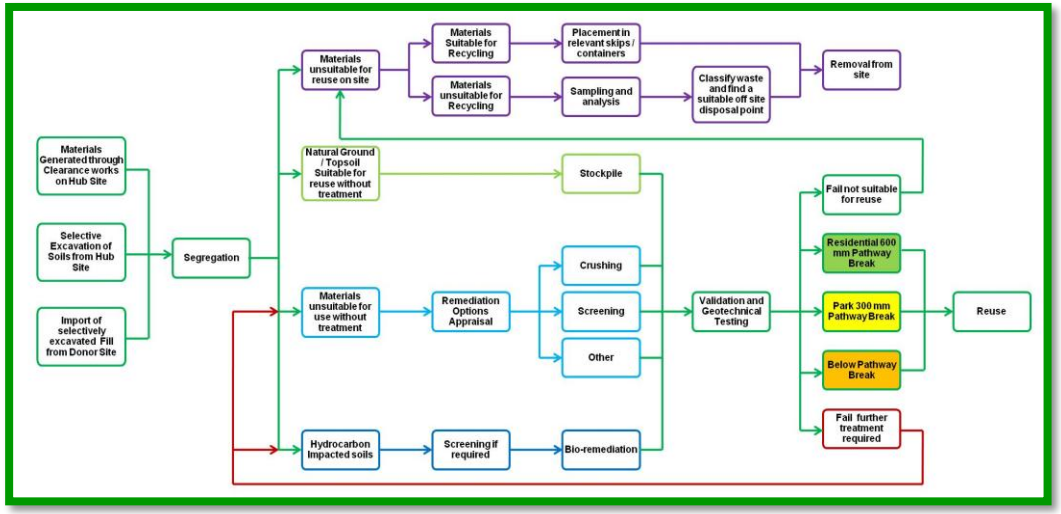
Material Classification at Donor Site

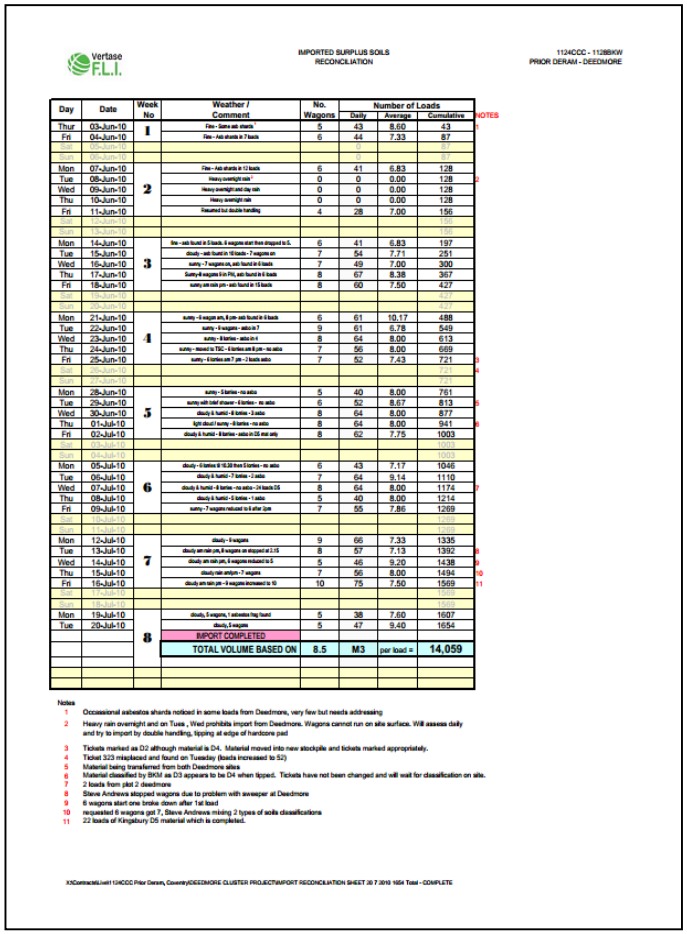
- Key was management of material at donor site;
- Developed a grouping system at donor site to categories material prior to import;
- Soil was transferred between site under full duty of care;
- Treatment (where required) was completed on hub / receiver site (landfill);

Donor Site Group	Classification	Process
Group D1:	Clean Topsoil / Natural Soils not requiring treatment.	Topsoil and Natural Soils from areas known to be free of chemical contamination and free from visual and olfactory evidence of either deleterious or chemical contamination. Excavated and stockpiled for transfer as inert material. Received by Hub Site and stockpiled. This material will then undergo chemical validation and geotechnical testing, prior to reinstatement.
Group D2:	Topsoil requiring treatment / processing	Topsoil from areas known to contain chemical contamination or exhibiting visual or olfactory evidence of contamination and deleterious material i.e. ash, clinker, glass. Excavated and stockpiled for transfer as non hazardous material. Received by Hub Site and stockpiled in the designated treatment area where it will initially undergo physical processing as required and chemical analysis to determine if treatment is necessary. The material will then undergo treatment as necessary and chemical validation and geotechnical testing prior to reinstatement.
Group D3:	Made Ground not requiring treatment.	Made ground from areas known to be free of chemical contamination and free from visual and olfactory evidence of either deleterious or chemical contamination. Excavated and stockpiled for transfer as inert material. Received by Hub Site and stockpiled. This material will then undergo chemical validation and geotechnical testing, prior to reinstatement.
Group D4:	Made Ground requiring treatment / processing	Made ground from areas known to contain chemical contamination or exhibiting visual or olfactory evidence of contamination and deleterious material i.e. ash, clinker, glass. Excavated and stockpiled for transfer as non hazardous or hazardous soils. Received by Hub Site and stockpiled in the designated treatment area where it will initially undergo physical processing as required and chemical analysis to determine if treatment is necessary. The material will then be treated as necessary and undergo chemical validation and geotechnical testing prior to reinstatement.

Receiving Site Records

- Very clear and detailed records kept at receiving site for verification report;
- Treatment train approach followed for materials once imported.





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IMPORTED SURPLUS SOILS RECONCILIATION

1124CCC - 1128BKW
PRIOR DERAM - DEEDMORE

Day	Date	Week No	Weather / Comment	No. Wagons	Number of Loads Daily	Average	Cumulative	NOTES
Thur	03-Jun-10	1	Fine - Some ash sheets	5	43	8.60	43	1
Fri	04-Jun-10		Fine - Ash sheets in 7 loads	6	44	7.33	87	
Sat	05-Jun-10				0		87	
Sun	06-Jun-10				0		87	
Mon	07-Jun-10	2	Fine - Ash sheets in 13 loads	6	41	6.83	128	
Tue	08-Jun-10		Heavy overnight rain *	0	0	0.00	128	2
Wed	09-Jun-10		Heavy overnight and day rain	0	0	0.00	128	
Thu	10-Jun-10		Heavy overnight rain	0	0	0.00	128	
Fri	11-Jun-10		Resulted but double handling	4	28	7.00	156	
Sat	12-Jun-10						156	
Sun	13-Jun-10						156	
Mon	14-Jun-10	3	fine - ash found in 8 loads. 4 wagons start then dropped to 5.	6	41	6.83	197	
Tue	15-Jun-10		cloudy - ash found in 10 loads - 7 wagons on	7	54	7.71	251	
Wed	16-Jun-10		sunny - 7 wagons on, ash found in 6 loads	7	49	7.00	300	
Thu	17-Jun-10		Sunny-8 wagons 8 in PM, ash found in 6 loads	8	67	8.38	367	
Fri	18-Jun-10		sunny am rain pm - ash found in 15 loads	8	60	7.50	427	
Sat	19-Jun-10						427	
Sun	20-Jun-10						427	
Mon	21-Jun-10	4	sunny - 6 wagon am, 8 pm- ash found in 8 loads	6	61	10.17	488	
Tue	22-Jun-10		sunny - 9 wagons - ash in 7	9	61	6.78	549	
Wed	23-Jun-10		sunny - 8 lorries - ash in 4	8	64	8.00	613	
Thu	24-Jun-10		sunny - Moved to TBC - 8 lorries am 8 pm - no asbs	7	56	8.00	669	
Fri	25-Jun-10		sunny - 6 lorries am 7 pm - 2 loads asbs	7	52	7.43	721	3
Sat	26-Jun-10						721	4
Sun	27-Jun-10						721	
Mon	28-Jun-10	5	sunny - 5 lorries - no asbs	5	40	8.00	761	
Tue	29-Jun-10		sunny with brief shower - 6 lorries - no asbs	6	52	8.67	813	5
Wed	30-Jun-10		cloudy & humid - 8 lorries - 3 asbs	8	64	8.00	877	
Thu	01-Jul-10		light cloud / sunny - 8 lorries - no asbs	8	64	8.00	941	6
Fri	02-Jul-10		cloudy & humid - 8 lorries - asbs in D5 not selg	8	62	7.75	1003	
Sat	03-Jul-10						1003	
Sun	04-Jul-10						1003	
Mon	05-Jul-10	6	cloudy - 6 lorries 6/10.30 then 5 lorries - no asbs	6	43	7.17	1046	
Tue	06-Jul-10		cloudy & humid - 7 lorries - 2 asbs	7	64	9.14	1110	
Wed	07-Jul-10		cloudy & humid - 8 lorries - no asbs - 24 loads D5	8	64	8.00	1174	7
Thu	08-Jul-10		cloudy & humid - 5 lorries - 1 asbs	5	40	8.00	1214	
Fri	09-Jul-10		sunny - 7 wagons reduced to 6 after 2pm	7	55	7.86	1269	
Sat	10-Jul-10						1269	
Sun	11-Jul-10						1269	
Mon	12-Jul-10	7	cloudy - 9 wagons	9	66	7.33	1335	
Tue	13-Jul-10		cloudy am rain pm, 8 wagons on stopped at 2.15	8	57	7.13	1392	8
Wed	14-Jul-10		cloudy am rain pm, 6 wagons reduced to 5	5	46	9.20	1438	9
Thu	15-Jul-10		cloudy rain am/pm - 7 wagons	7	56	8.00	1494	10
Fri	16-Jul-10		cloudy am rain pm - 9 wagons increased to 10	10	75	7.50	1569	11
Sat	17-Jul-10						1569	
Sun	18-Jul-10						1569	
Mon	19-Jul-10	8	cloudy, 5 wagons, 1 asbestos frag found	5	38	7.60	1607	
Tue	20-Jul-10		cloudy, 5 wagons	5	47	9.40	1654	
			IMPORT COMPLETED					
			TOTAL VOLUME BASED ON	8.5	M3	per load =	14,059	

Notes

1 Occassional asbestos shards noticed in some loads from Deedmore, very few but needs addressing
2 Heavy rain overnight and on Tuesa , Wed prohibits import from Deedmore. Wagons cannot run on site surface. Will assess daily and try to import by double handling, tipping at edge of hardcore pad
3 Tickets marked as D2 although material is D4. Material moved into new stockpile and tickets marked appropriately.
4 Ticket 323 misplaced and found on Tuesday (loads increased to 52)
5 Material being transferred from both Deedmore sites
6 Material classified by BKM as D3 appears to be D4 when tipped. Tickets have not been changed and will wait for classification on site.
7 2 loads from plot 2 deedmore
8 Steve Andrews stopped wagons due to problem with sweeper at Deedmore
9 6 wagons start one broke down after 1st load
10 requested 6 wagons got 7, Steve Andrews mising 2 types of soils classifications
11 22 loads of Kingsbury D5 material which is completed.

X:\Contracts\Live\1124CCC Prior Deram, Coventry\DEEDMORE CLUSTER PROJECT\IMPORT RECONCILIATION SHEET 20 7 2010 1654 Total - COMPLETE

Cluster Project: Watchpoints

- Reliant on a timings of sites locally so can be difficult to coordinate;
- Detailed records needed to confirm volume, material import and re-use horizons;
- We would have completed under a Brownfield to Brownfield transfer now;
- CLAIRE Case Study bulletin available on their website.

CSB 9 page 2

case study bulletin

iv) Details of how these materials are to be tracked
v) Contingency arrangements that must be put in place prior to movement of these materials.

All documents relevant to the assessment and reuse of materials as detailed in the MMP must be reviewed by a Qualified Person. The Qualified Person will then sign a Declaration to confirm the information reviewed meets the requirements of the Code of Practice. The Qualified Person is an individual who must possess certain attributes and be registered as a Qualified Person with CL:AIRE.

2.3 Cluster Arrangement

Whilst the Code of Practice will primarily be used for the reuse of soils on sites from where they were generated, it also includes details on how to facilitate the remediation and development of a number of sites that are in close proximity (i.e. in a Cluster) and which can share a decontamination facility located on a single site. The single site utilised for decontamination is referred to as a Hub site. Other sites can then export soils to the Hub site for treatment under the Environmental Permit held by that facility. These other sites are referred to as Donor sites. Once deemed suitable for use which must include demonstrating a need, the treated soils can then be exported back to any of the Donor sites, reused at the Hub site, or any combination thereof. They are then also referred to as Receiver sites.

3. PRACTICAL APPLICATION: SITE DESCRIPTION

VertaseFLI was employed to undertake remediation and reclamation works on a former landfill in Coventry on behalf of Coventry City Council. The landfill was created by the land filling of demolition and site clearance waste from buildings destroyed by bombing during World War II. On the worst night of bombing, 14th November 1940, over 4,000 homes were destroyed and 75% of the city's factories were either destroyed or badly damaged, by high explosive and incendiary bombs (BBC website). Contaminants present included heavy metals and hydrocarbons which posed a risk to human health and controlled waters respectively.

Following completion in the early 1950s, the site became a public park. More recently, the council wanted to redevelop three quarters of the park for a residential end use, whilst remediating and returning the remaining quarter to a high quality green space/park area.

In addition to the remediation requirements, certain other works were required to render the site suitable for residential redevelopment. The site was susceptible to flooding and the landfill was constructed by loose tipping resulting in up to 4 m of unconsolidated fill. Therefore, in addition to the remediation requirements, VertaseFLI deemed dynamic compaction the most appropriate methodology to address the unconsolidated fill (Figure 1).

Remediation works entailed selective excavation of overlying landfill cap and up to 800 mm of the underlying landfill materials. Materials were subjected to physical processing and *ex situ* bioremediation followed by appropriate validation. Reuse was undertaken after dynamic compaction in a controlled manner so that the site was re-instated with an appropriate pathway break layer thus breaking the source-pathway-receptor linkage between the underlying residual landfill and end site users.

Figure 1. Dynamic compaction

A detailed Remediation Strategy was prepared and approved by the Coventry City Council Contaminated Land Officer and the Environment Agency and encompassed site-specific, risk-based targets produced from risk assessments undertaken by the councils' consultant, Atkins. All remediation works were undertaken under an Environmental Permit (formerly a Mobile Treatment Licence) and site specific Deployment Form prepared by VertaseFLI and approved by the Environment Agency.

The reuse of soils after remediation was undertaken under the Code of Practice in accordance with a MMP prepared for the project. Due to the size of the project, a Site Waste Management Plan (SWMP) was also prepared. Whilst VertaseFLI employs individuals who are registered Qualified Persons, a decision was taken, for reasons of maintaining transparency and to meet the requirements of project independence, to employ an external Qualified Person from Atkins.

It is worth noting that the reinstatement of materials excavated for remediation purposes was undertaken to a strict compaction specification which would result in a slight reduction in overall site levels. Further, the proposed dynamic compaction was likely to lead to significant *in situ* compaction reducing site levels still further. Therefore, in order to maintain the site at appropriate development levels in accordance with planning and flood protection requirements, it was necessary to import materials to re-instate the site to historic site levels which confirmed a definite need for materials.

4. ESTABLISHING A CLUSTER ARRANGEMENT

During early design discussions with Coventry City Council and Atkins, the prospect of using the site as part of a Cluster arrangement was discussed and agreed. Early discussions were also held with the Environment Agency which also agreed and supported the proposed approach. Coventry City Council were particularly supportive of the Cluster proposal not least because they had sold (and still had an interest in) a former school site approximately 12 km away, to a consortium of three different house builders. This former school site was to generate a significant quantity of surplus materials some of which were contaminated. VertaseFLI entered into contractual arrangements with the house building consortium to prepare an appropriate MMP and import approximately 11,500 m³ of surplus soils from the former school site which would become a Donor site, onto the subject site which would become both the Hub (treatment) and Receiver site.

Waste Recovery Permit

- 2.3ha historical landfill site;
- Located within a larger area (99ha) approved for redevelopment in South Gloucestershire – Emerson's Green Urban Village;
- Received ~60,000m^3 of waste between 1984 – 1991;
- Dilute & disperse (no engineered controls);
- Proposed to construct houses and estate roads on the site.

Waste Recovery Permit

- DOWCOP and Environmental Permit (Mobile Plant);
  - After extensive discussion with the EA, the use of the a Mobile Permit deemed not appropriate by Local Environment Agency;
  - Considered the excavation and re-use of landfill materials comprised a "Waste Recovery Operation" and that the works were essentially **Landfill Mining**;
  - No permit meant we couldn't use DoWCoP;
  - Only route forward was to apply for a Bespoke Waste Recovery Permit covering both treatment and Re-Use of Materials.
  - Will not be appropriate for every site.

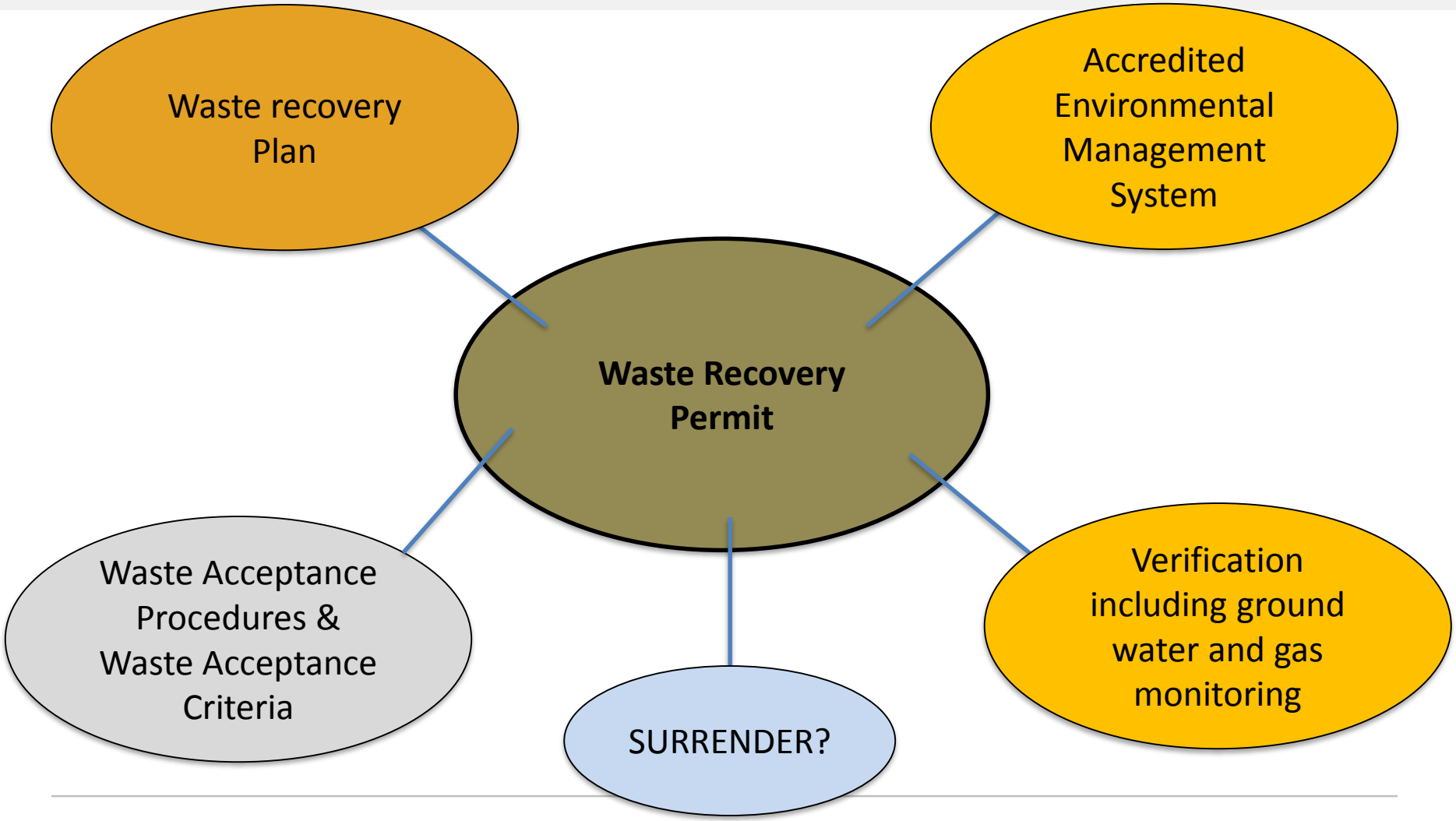
Waste Recovery Permit

- Before we could apply for a permit needed to complete a Waste Recovery Plan;
  - Assessed by EA to determine whether they considered the works recovery, or disposal;
  - A disposal operation would mean we were operating as landfill with all the associated surrender / monitoring requirements;
  - Conclusion was that works were a recovery operation.

- Deposit for Recovery Permit, still an onerous route:
  - Application Fees;
  - Prolonged 'Duly Made' and 'Review Periods;
  - Permit surrender needs to be accepted by the Environment Agency;
  - Calculation / generation of bespoke 'Waste Acceptance Criteria' targets.

- Is this now EA policy….. Other sites still operating under DoWCoP ?

Waste Recovery Permit



Non-Enforcement Position

- Not a common option, We've only used once !
- Site had a large volume waste illegally deposited on it (not by landowner):
- Owner keen to re-use waste where possible to reprofile the site (planning condition granted);
- DoWCoP could not be used as materials already excavated and deposited as a waste (illegally);
- EA agreed that although the DoWCoP not applicable, they would take a Non-enforcement position if the works were completed in accordance with the DoWCoP.
- Therefore a full MMP was produced for the screening and re-use of waste on site and submitted to the local EA office for approval.

- Works completed under a Mobile Plant Licence.

Summary

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Take Home Messages

- Number of good mechanisms to allow re-use of various materials;
- Choose appropriately;
- Manage appropriately;
- Everybody wins.

Final Take Home Message

- The Environment Agency has been reviewing and auditing the use of the U1 exemption and DoWCoP in light of perceived misuse and 'sham recovery' operations.

- Material not re-used in accordance with WRAP, Exemptions, Permits, DoWCoP may now be liable to attract landfill tax as well as breaching previously existing waste legislation!!!

Policy paper

Landfill Tax: disposals not made at landfill sites

Updated 16 March 2018

Thank You!

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FLI