APPENDIX 1

THE TIP MAINTENANCE OPERATIONAL PLAN IN CAERPHILLY COUNTY BOROUGH

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1. Introduction

1.1.1 This report provides an overview of Caerphilly County Borough Council's approach and execution of tips maintenance within the county boundaries. This is done under a set of parameters which determine the criteria under which this function is carried out for the council. These parameters can be outlined under the following headings:

1.2 Definitions

1.2.1 The definition of tips can broadly fall into two categories:

- **Coal spoil or spoil tips** – these are primarily constituted from the excess material generated from coal and ore mining activity, this being, largely, the non-productive element excavated as part of these activities. However, coal tips may contain significant quantities of coal which were not extracted as part of the saleable content at the time of operation and may constitute a risk from self combustion if present in sufficient quantity and under the correct conditions. By the nature of their formation many tips are in close proximity to populated areas. Very few are now associated with active mining and are therefore classified as 'disused'.

- **Municipal tips** – these consist of house-hold and non-industrial waste, commonly referred to as 'land-fill', these are usually recent in formation or are still active. The principle council concern for these sites is centred on environmental health and so does not form part of this plan.

1.3 Relevant Legislation

1.3.1 In England and Wales primary legislation is contained in general terms by Acts of Parliament which set out the general principles, this is further refined by regulations which explain, extend or amend the parameters of the relevant Acts these being:

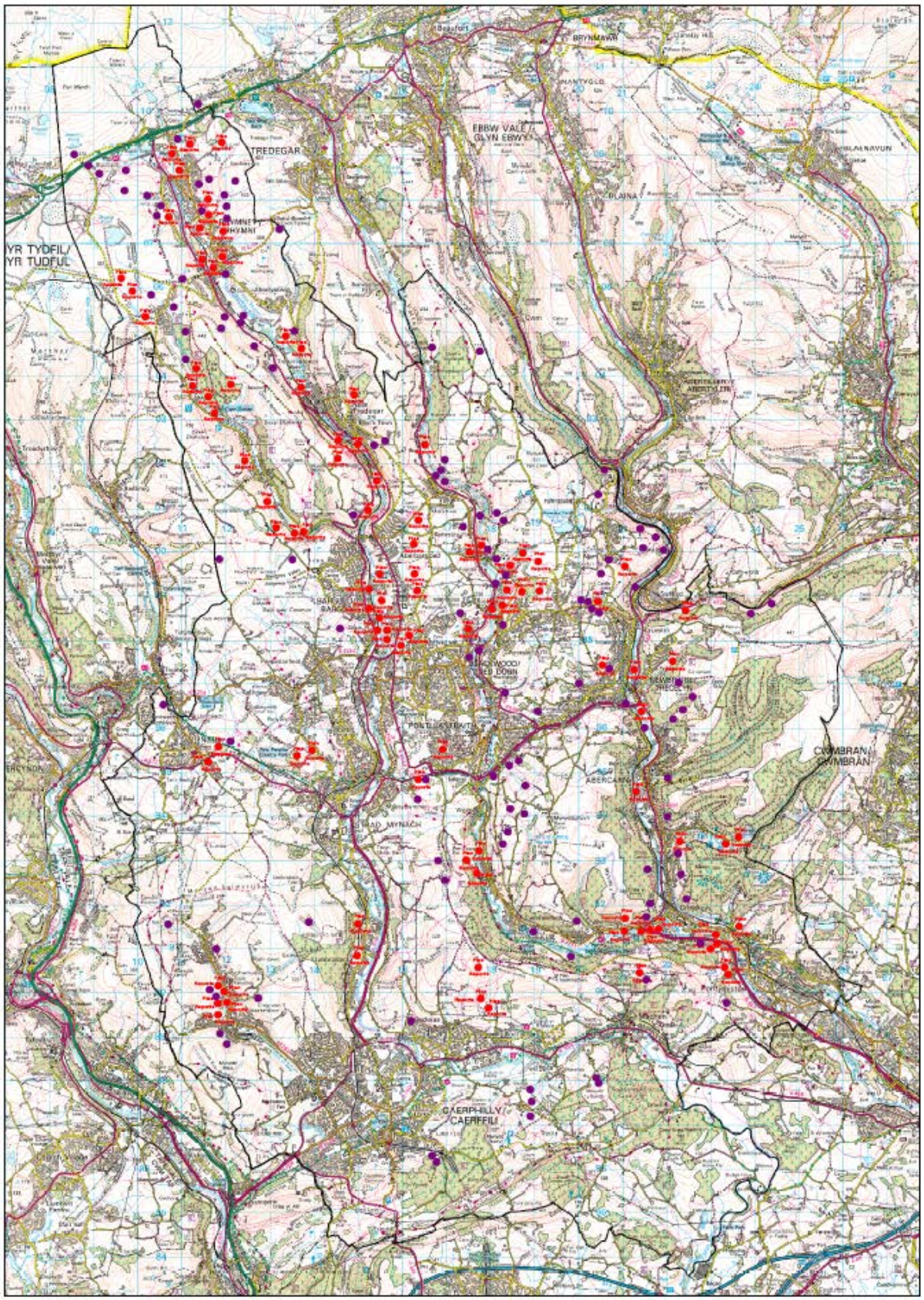
- Mines and Quarries (Tips) Act 1969
- Mines & Quarries (Tips) Regulations 1971

1.3.2 These focus on the spoil heaps and lagoons, they lay down the requirements concerning their stability and safety, in addition Town and Country Planning legislation controls the location, size and restoration requirements of disused tips. These form the basis on which inspections are carried out.

1.3.3 Though the 1969 Act makes legal provision for local authorities to carry out inspections, undertake maintenance of tip sites and act if there are instances of instability and imminent danger, it does not impose a statutory requirement for routine inspections or give the automatic right of entry to these sites.

1.4 **Existing Position of the Council**

1.4.1 There are 229 tip sites within CCBC boundaries, of which 102 are in the Authority's ownership (full listing in Appendix 2), the remainder (127) are privately owned (a full listing in Appendix 3). The council owned sites are subject to the 'in house' Tips Maintenance Regime. Tips in private ownership are not inspected by the Authority.



Map above shows the locations of tips within the County boundary – red spots are CCBC responsibility, purple are in private ownership (not currently inspected by CCBC)

1.4.2 The fact that a tip appears to be static and to have been so for some time is no guarantee that it will remain so. When the factor of safety falls below a critical point some movement may occur, which, if conditions continue to deteriorate, will accelerate until 'failure'. This is why it is essential that these tips are monitored on a regular basis and proactive maintenance undertaken to ensure their stability. These activities form the focus of this report.

1.4.3 The inspection and maintenance of private tips are primarily the responsibility of their respective owners. CCBC has notified all identified owners of their legal obligations, as per the Mines and Quarries (Tips) Act and Regulations. Though the council requires permission from the owner to enter these sites, CCBC can do so if an imminent danger is perceived and urgent action is required to rectify the situation. In these cases the council can then charge the associated costs to the owner(s).

2. Process

2.1.1 A robust and auditable tip inspection and maintenance regime was developed during 2011-13, including a review of existing practices. The results from this review formed the base line inspection regime for all of the tips (both CCBC and private). Although as stated previously the private tips are not currently inspected by the Authority.

2.1.2 The Tip Risk Rating and Maintenance regime was demonstrated to the Coal Authority (CA) in 2013, who noted the CCBC system was exemplary and demonstrated sound good practice and provides a robust proactive stance.

2.1.3 The Tip risk register is supported with documentation demonstrating the methodology which operates behind it and the Tip Portal also acts as a repository for all current and historic tip inspection records, as well as current legislation and good practice.

2.2 Establishing Tips Maintenance in Caerphilly County

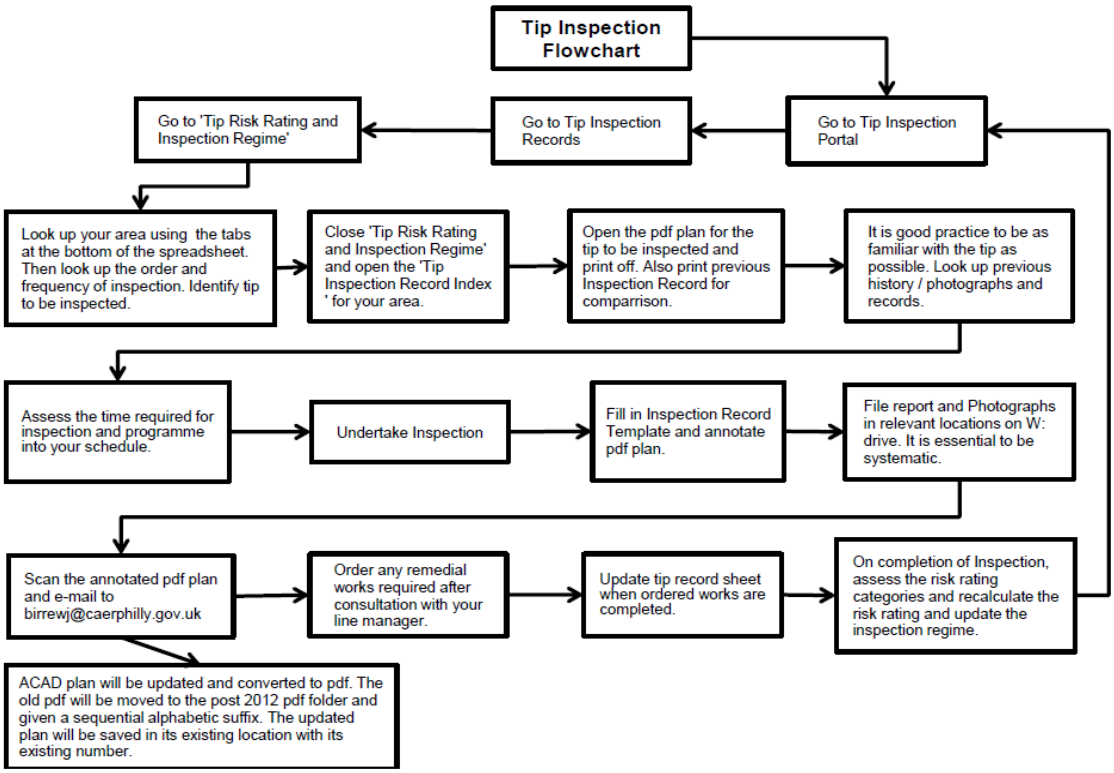
2.2.1 The review process consisted of a series of inspections of each of the sites with a risk assessment exercise formalising the results found. As defects and faults were identified on each site they were recorded and mitigation measures put forward for correction. A scoring matrix allowed categorization of risk ensuring the tips were prioritised from high to low. This exercise was undertaken between 2011 to 2013, with the higher risk sites being reviewed first. This formed the base-line inspection regime required for each of the sites. This information and data constitutes the risk register for all 102 CCBC owned tip sites.

2.3 Current Regime

2.3.1 A Tips Maintenance Portal was set up in 2013 and acts as the repository of all data and information for CCBC tips. This contains all the risk assessments, reports, site specific features, inspection records, programmes etc. ; thereby providing a 'one-stop' approach for all tip information and data.

2.3.2 Highways inspectors currently carry out all tips inspections, after having undertaken in-house training for tips fault/ failure identification as well as including these sites in their on-site risk assessments and safety procedures.

Below is an example of a flowchart showing how the inspection process is followed by tip inspectors. The process is followed on a cyclic basis for each site.



(A blank copy of the current Tip Inspection Record Template can be found in Appendix 4)

2.4 Tips Maintenance Systems

2.4.1 The tip sites are regularly inspected with a frequency dependent on the categorization generated from the Risk Rating Matrix (all the risk scoring and the consequential inspection frequency for CCBC owned sites is shown in Appendix 2). The scoring for these sites can be summarised as follows:

- <4 = Low Risk – indicating a 2 yearly (biennial) inspection
- 4 to 69 = Medium Risk – indicating an annual inspection
- 70 to 299 = High Risk – indicating a 6 monthly inspection
- 300 and up = Significant Risk – immediate or urgent action required

There are no Significant Risk sites, 13 High Risk and 26 Medium Risk tips, the remainder (63) are Low Risk.

2.4.2 The scoring of these assessments is amended following each subsequent inspection, giving each site a 'live' record of their status. This then informs both the prioritised listing of mitigation works that are required and future frequency of inspection.

TIP INSPECTION PROGRAMME

Tip Number	Tip Name	Location	Date of Inspection DD?MM/YYYY	Revised Frequency of inspections	Revised Date for tip inspection	Time remaining to Inspection (in days) Green/Amber - Days remaining Red - Days Overdue	Comments
2	Hengoed Penallta Tips	Penallta Community Park	26/05/2016	1 year	26/05/2017	-99	Concern over erosion on western end of the plateau
94	Llanbradach	Caerphilly Road, Llanbradach	26/05/2016	1 year	26/05/2017	-99	The section of CCBC owned tip is unaccessable due to the overgrowth.
3	Gilfach Britannia Colliery	Bargoed relief road, Gilfach	18/03/2015	2 years	18/03/2017	-30	Maintenance on drainage required.
34	Hengoed	Penallta Road, Penallta	21/04/2016	1 year	21/04/2017	-64	Suspected seepage to be monitored, drainage ditch to be cleared
39	Bargoed	Llewelyn Street, Gilfach	20/04/2016	1 year	20/04/2017	-63	Review erosion on riverbank north of A469 overpass.
208	Bargoed Colliery	Angel Lane, Gilfach	20/04/2016	1 year	20/04/2017	-63	Concern over precast retaining wall ornamental panels in river. Maintenance on drainage required.
83	Pengam Road, Bargoed	Pengam Road, Aberbargoed	14/02/2017	1 year	14/08/2017	-179	Being actively filled in SE corner. Maintenance on drainage required. Drainage works completed 14/11/14 - 30016652
42	Llanbradach Old Colliery	Wingfield Crescent, Llanbradach	14/02/2017	2 years	14/02/2019	-728	Maintenance on drainage required.
4	Bargoed Football Pitch	Andrews Close, Gilfach	14/02/2017	2 years	14/02/2019	-728	0

An example of a Tips Maintenance Inspection Sheet from Inspection Area 3

2.4.3 Any changes in the scoring given in the Tip Risk Rating (which is affected by the condition of the site) and the additional summary comments (given on the Inspection Regime section and Tips Inspection Programme - example seen above), are then reviewed to confirm that the correct inspection frequency is being carried out and that the existing programme of mitigation measures are adequate.

2.4.4 Any issues that are identified as being outside the routine maintenance programme are then risk assessed as candidates for more involved works and the associated funding, this being capital funding for larger scale schemes.

2.5 Access to the System

2.5.1 The Tips Portal is the entry point into this aspect of Engineering Services, with all the historical and live documentation held in this one repository. Access is restricted to authorised officers only to allow selective editing to existing records and information to maintain the integrity of the system.

3. Works Under-taken

3.1.1 There are many factors which may result in instability of a tip and these factors are considered as part of the risk rating procedure. This in turn allows the Authority to be proactive in assessing the risks to individual sites and actively manage those factors which are, or may become, issues.

3.2 Maintenance Activities

3.2.1 Water is by far the most likely cause of instability within, or on, tips. Tips can be sited on springs or across water courses that can destabilise particular areas or the foundation of the tip. Additionally, the lack of finer grain substrate (soils/ clays etc.) means that erosion can more easily take place along any naturally formed drainage channels. For these reasons close attention must be given to all drainage and ground conditions in the vicinity of a tip. It is therefore essential that any proactive management of CCBC tips include:-

- Ditch reinstatement (vegetation removal, re-profiling of ditch cross-section etc.)

- Drainage improvements
- Relining of open drainage channels
- Dredging settlement ponds
- Fencing repairs
- Slope re-grading
- Repairing of damage/ vandalism (natural or man-made)

3.2.2 The core of this is carried out as a proactive maintenance service with specific schemes targeted at those high risk sites.

Site photographs taken on site to demonstrate the effective clearance of a tip concrete drainage channel

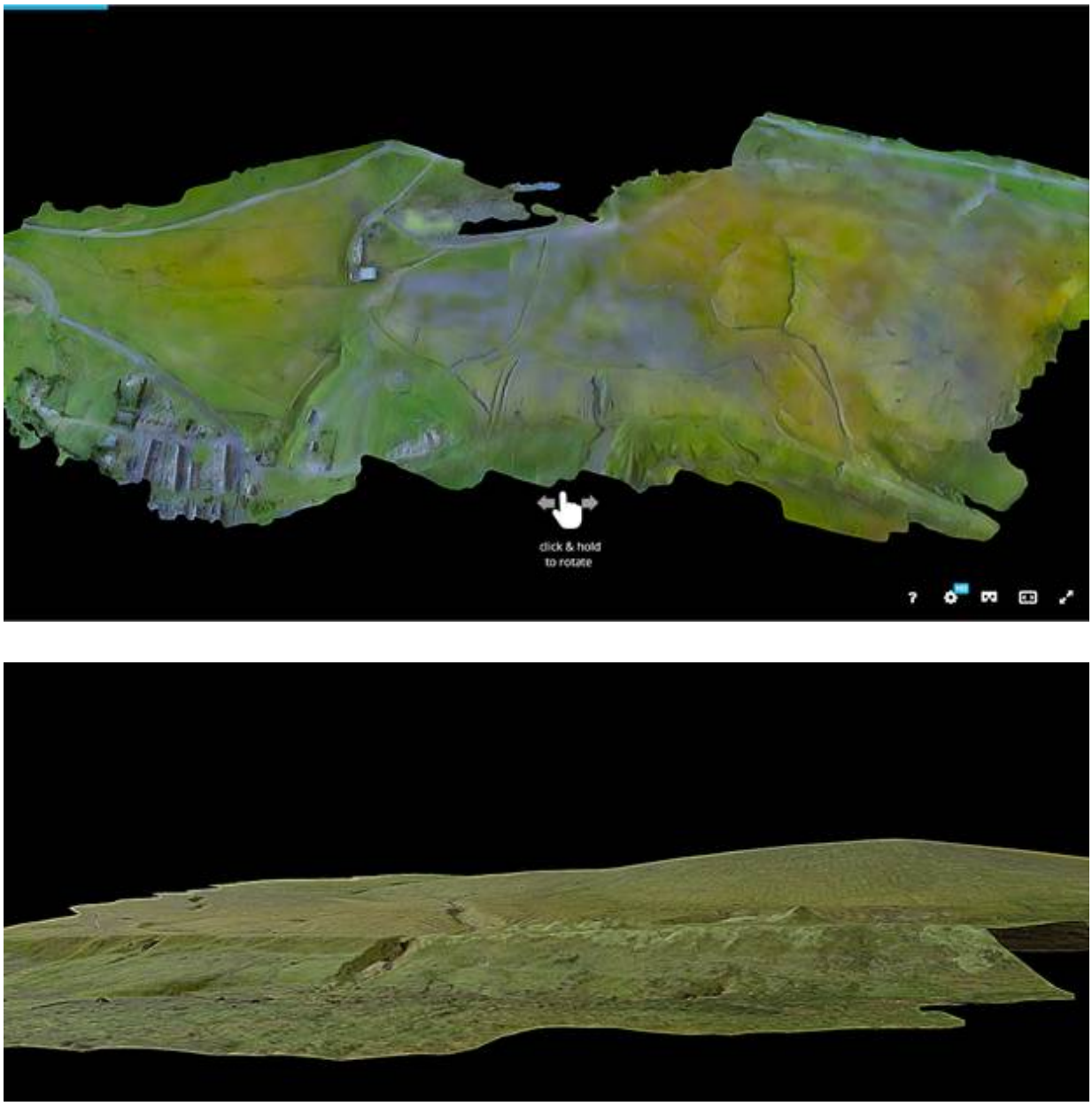
3.3 Maintaining and Improving Tip Performance

3.3.1 The strategy for tip maintenance is to carry out routine and small scale maintenance based on the inspection records and the risk categorization of the tip. For identified higher risk sites which require significant works (constructing or re-establishing concrete channels, large scale perimeter fencing etc.), a capital budget is utilised with the use of both internal and external contractor teams. This ensures long term proactive management of those high risk sites.

4. Future Developments

4.1.1 Technology is constantly developing and as part of a future proactive tip management system regime, certain elements of innovation can be incorporated. Whilst they do not necessarily replace existing systems they can help to reinforce the robust system currently in place, ready examples are:

- the use of mobile devices to record and monitor tips inspections
- the use of aerial drones to remotely inspect sites with the ability to compare surveys on an annual basis to detect any long-term defects or movements



Examples of 3-D Modelling produced from a drone survey at the Fochriw tip site in 2016

5. Conclusion

5.1.1 In summary the tip sites in CCBC can be initially categorised as CCBC owned and privately owned. The former are risk assessed, inspected and maintained by Highway Operations; and the principle responsibility for the latter is with the owner(s).

5.1.2 The system adopted by CCBC for tips maintenance has been established since 2013 and has been positively reviewed by the Coal Authority. This process has evaluated the risk rating on each of the CCBC owned sites to determine inspection frequency and required mitigation works. The ongoing inspection regime on these sites ensures that issues are identified early enough for remedial action to be taken and consideration can be given to potentially larger scale works that may require a capital investment in the medium to longer term.

5.1.3 Good practice and innovation are central to this aspect of Highway Operations and steps continue to be taken to improve and develop more effective ways of carrying these tasks out.