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Corangamite Catchment
Management Authority and the
Colac Otway Shire

**EMO Implementation for
Colac Otway Shire**

Summary Report

Project Report - 30 June 2006

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1. Introduction

The Corangamite Catchment Management Authority (CCMA) is currently finalising the Soil Health Strategy (CSHS) as a sub strategy of the Corangamite Regional Catchment Strategy (CRCS). The development of the Erosion Management Overlays (EMO) for municipalities throughout the CCMA region (including Colac Otway Shire COS) is a priority action under the CSHS and is viewed as a critical process to allow COS address both strategic and developmental issues of land degradation and soil health.

The overall development and implementation of EMOs within the CCMA region also facilitates a key CCMA function by providing water quality benefits through the reduction in erosion. Key municipal objectives are also likely to be achieved through reductions in liability, risk to infrastructure and the general public and the protection of the environment.

As a result of ongoing developments under the CSHS, a pilot project was commenced in the City of Greater Geelong (CoGG) in 2004. The key aims of the project included the development of critical elements of an Erosion Management Overlay (EMO) such as schedules, maps and supporting documentation with a view to making such information available to other municipalities in the region.

The process for implementation has evolved during the course of the project and now includes two separate schedules under the EMO. EMO1 will address the risk of landslides while EMO2 will address the risk of soil erosion.

The current co-investment for 2006 between the CCMA and the COS reflects the desire to standardise processes throughout the region and will provide the COS with refined landslide susceptibility maps, an updated planning schedule and associated documents to assist with the next iteration of EMO1 (lands subject to landslides). In addition other working draft documentation will also be provided to assist with the longer term goal of implementation of EMO2 (lands subject to erosion).

This report details the progress of the first phase of this project development of the project and provides information and data on the products and project implementation elements delivered by the CCMA to COS under the terms of the original co-investment agreement.

2. Key Objectives of the Overall Project

The key objectives and aims of the overall project as related to the CRCS and the CSHS include:

- The development of an erosion management overlay (EMO) and associated documents for the CoGG to reduce the risk and subsequent impact of landslides and soil erosion through the planning scheme.
- To use outcomes from the CoGG EMO pilot study, to encourage other municipalities within the Corangamite Catchment to adopt a similar approach.
- To formalise an agreement between the COS and the CCMA that outlines each organisation's commitment to complete and implement both EMO1 and EMO2.

The use of erosion management overlays to address issues of soil health and land degradation is seen as a critical element in achieving the goals of both the CRCS and the CSHS. The implementation and use of an EMO will provide each municipality in the region with a number of benefits relating to a diverse range of issues including:

- Responsibility and duty of care.
- Liability.
- Economic considerations.
- Environmental diligence and commitments.
- Social responsibilities.

Further detailed discussion on each of these aspects is contained in Appendix A.

3. Background

3.1 Background to the Current EMO and Planning Scheme

The following section contains an extract from the final report on Landslide Risk Management prepared by Dahlhaus Environmental Geology for the Colac Otway Shire.

“Within the Shire area, landslide risk management commenced in a formal way in 1979, when the Town and Country Planning Board requested the Geological Survey of Victoria (GSV) to conduct a landslide hazard study of the Otway Ranges (Cooney, 1980). The involvement of the Shire commenced in August 1984 when the State Government approved the Shire of Otway (Ocean Road) Interim Development Order (IDO). The IDO gave the responsibility for planning to the Shire’s Planning Officer for residential areas (“Village Zones”), and to the Ministry for Planning and Environment (MPE) in all other areas. Under the conditions of the IDO, applications for planning permits in areas designated prone to landslides were referred to the GSV and the Land Protection Service (LPS, formerly the Soil Conservation Authority (SCA)) for comment. Subsequent restructures of State Government departments, amalgamation of municipalities and changes in planning laws has modified the procedures for landslide risk management in the Shire.

The Colac Otway Shire inherited their landslide risk management procedures from the former Shire of Otway. Under the planning guidelines of the former shire, two special control areas were delineated - land subject to land-slip hazard was designated as Special Control area A whilst land of vegetation significance for the prevention of soil erosion was designated as Special Control Area B.

The issuing of a permit on any land within these special control zones was required for:

- Construction of a building.
- Construction and carrying out any works.
- Alterations to the natural topography.
- Clearing any vegetation.

Subsequent revision to the Colac Otway Shire Planning Scheme resulted in the production of a series of planning overlay maps. One of these planning overlay maps which was designated as the Erosion Management Overlay (EMO), incorporated the previous Special Control Areas A and B.

Under this scheme, a Planning Permit is required for buildings and works within the area designated as susceptible to landslides (i.e. the area within the existing EMO). A report detailing the landslide risk is required to be submitted with the Application for a Planning Permit. The report is to be prepared by:

“...a professionally qualified Engineering Geologist or Geotechnical Engineer with experience in slope stability problems and whose qualifications, dates of qualifications and appropriate experience must be indicated.”

Prior to July 2000, the report was only required to supply a visual assessment of the slope stability of the site and surrounding area supplemented by unspecified additional work as required. The report was also required to advise of one of three conclusions:

- That there are no slope problems and that a permit should therefore be issued without specific guidelines for development of the site.
- That identified slope problems can be overcome by defined means giving guidelines for development of the site allowing the granting of a conditional permit.
- That slope problems are too serious that a permit should not be issued.

The required conclusions left no room for doubt with the onus placed on the engineer or geologist to provide a definitive answer to whether development was allowed or not.

Where the assessment was considered to be inadequate by the Shire a supplementary report or an additional report by a different engineer or geologist (i.e. second opinion) could be requested.

The supplementary or additional report required:

- Mapping of geological and slope features.
- Slope profile measurements.
- Drilling, sampling and laboratory or field testing.
- Mapping or incipient movements and past failures, including creep.
- Groundwater occurrence.
- Stability analysis and conclusion on stability of the land under the conditions of its intended use.

However, the planning scheme offered no guidance on how this additional information was to be used and how resolution of difference of opinions between consultants was achieved. “

3.2 History of the C8 Amendment

Initial discussions regarding the review of landslide risk management under the planning scheme of the Shire were initiated with Mike Ferey in April 1998. Subsequent discussions with Rob Davis and Steve Mitchell recognised the need to expand the study to assess other natural resource management issues under the broader project goal of undertaking a land capability assessment for the shire.

A project proposal was submitted in August 1999 and accepted by Council in September 1999. The Land Capability Assessment project was initially proposed as a three year study to provide “relevant information on the Shire’s physical environment, for land use planning and assessment”.

However, the major component of Stage One was a review of the Shire’s landslide risk management due to the significant and sensitive nature of this issue within many parts of the shire. The initial review included a review of the existing risk management practices in the Shire and within other municipalities throughout Australia. All available previous studies were reviewed and previous geotechnical assessments for planning applications were collated and analysed. Limited historical data was researched but no new investigations of individual landslides were undertaken as part of the initial stage one study. A database of existing mapped landslides was constructed in a GIS format and new data was generate in the form of topographic and climate surfaces.

The initial review of landslide risk management was extended with an interim report submitted in July 2000 and a final report submitted in June 2001. Key recommendations from the reports included:

- An extension to the existing EMO to include all areas of the Shire susceptible to landslide.
- The adoption of the national guidelines published by The Australian Geomechanics Society for Landslide Risk Management.
- The development of a GIS database incorporating mapped landslides and previous assessments for internal use only.
- The adoption of new planning permit procedures incorporating issues such as provision of public information, consultation of the GIS database to assess applications, the use of a preliminary on-site assessment as a screening tool, requirements for land stability reports, internal requirements for the assessment of reports and compliance issues.
- Changes to the EMO Schedule incorporating the new procedures and exemptions.
- Continuation of research into landslide risk management issues and the fostering of links with adjoining shires and other relevant organisations such as the CCMA, DNRE and VicRoads.

The major recommendations were subsequently adopted by Council and Amendment C8 was prepared. The amendment went through public exhibition with a series of public meetings conducted throughout March 2003. Submissions on the amendment were accepted by Colac Otway up until May 2003.

The final C8 amendment was then sent to the Minister for approval in late 2003. Upon submission of the amendment to the Minister, the Department of Sustainability and Environment raised two major concerns with the amendment which required a reduction of the scope of discretion in determining whether or not a planning permit is required and a greater list of exemptions from the need for permits for buildings and works given the application of the EMO to extensive areas of the municipality.

These changes requested by DSE were incorporated into the amendment which was resubmitted to the Planning Committee of Council on 20th April 2005 where the modifications were adopted. The revised amendment C8 was resubmitted to the Minister in June 2005. COS are currently awaiting approval for this amendment.

4. Phase 1 Proposal– 2006

As previously discussed one of the CCMA's aims under its Soil Health Strategy is to assist with the development and implementation of a standard approach to Erosion Management Overlays throughout the region. The approach is currently based on the model being developed during the pilot study with the City of Greater Geelong. The key elements of this approach include:

- The revision of existing small scale regional land degradation susceptibility maps (1:100,000). These maps are being combined with additional large scale ortho-photographic mapping of land degradation features and on site mapping by landcare groups to enable refinements of the susceptibility maps.
- The refined susceptibility maps will serve as key background material and will be used to produce appropriate boundaries for a new EMO.
- The development of a suitable planning process incorporating potential referral authorities and having due regard to individual municipalities resource issues.
- The production of two individual schedules including EMO 1 for landslide and EMO 2 for erosion.
- The production of supporting documentation and reports including bibliography of known sources of data, procedures manuals and public education/information material.
- Assessment of the feasibility and subsequent development of a central data and information repository for current information reports and databases relating to erosion, landslides and related topics that are currently in the public domain but may not be readily accessible. The aim of such a repository is to assist with information dissemination to the general public, municipalities, referral authorities and consultants and the development of better resourced and more informed reports and information on land degradation processes.
- Inclusion of considerations of erosion, landslide and land degradation within appropriate municipal strategies such as the Municipal Strategic Statement (MSS) and Environmental Management Strategy (EMS).

Colac Otway Shire have long recognised the benefits of better data management and access and as such through the efforts of Greg Slater are currently leading discussion on the feasibility of alternative approaches to data storage and delivery. It is anticipated that such development can be adapted to the broader issue of data management throughout the entire CCMA region and it was proposed to incorporate this work as part of the current co-investment proposal.

The current broad Colac Otway EMO overlay (and the C8 amendment currently with the Minister) was previously linked to a process aimed at identifying potential low risk sites early in the process and removing the onus for detailed geotechnical reports and supporting documentation.

A key element of the current co-investment proposal was the refinement of the existing Colac Otway overlay in order to rationalise the spatial extent of the overlay by removing low risk sites where possible within the limits of the existing data sets.

As a result a series of tasks were proposed for completion by June 2006. Details are contained in Table 1

<i>Output</i>	<i>Delivering Responsibility</i>	<i>CCMA investment</i>	<i>COS investment</i>
Refine the existing EMO overlay, including susceptibility maps for LANDSLIDE and EROSION with limited field checking.	Consultant	\$20,000	5,000
Planning Scheme Schedule	Consultant	\$2,000	0
Revise COS Internal Procedure and Guidelines Manual.	Consultant	\$3,000	0
Prepare public information and education pamphlets.	DPI	\$3,000	0
Development of data repository and distribution system (preferably a single source, easy to use, web based access with review of data quality and caveats and limitations on data use).	COS	0	\$20,000
<u>TOTAL</u>		<u>\$28,000</u>	<u>\$25,000</u>

Table 1 Co-investment proposal between the CCMA and COS for 2005/2006.

5. Outputs for EMO Phase 1 2005/06

As a result of works carried out during the EMO implementation pilot study for the City of Greater Geelong and specific tasks undertaken as part of the current co-investment agreement between the CCMA and the COS a diverse range of project outcomes including maps, schedules and associated documents have been completed.

Deliverables can be divided into three main classes of tasks and information:

- General Information.
- Information relating to the EMO1.
- Information relating to the EMO2.

5.1 General Information

General tasks and information aimed at assisting the implementation of an EMO within the COS planning include:

5.1.1 Report on Inventory of Information and Databases for Soil Degradation Processes in the CCMA region

A general report on an inventory of information and databases relating to soil degradation in the CCMA region including a bibliography of relevant reports and articles was prepared as part of the general information delivered to assist the implementation process. The report includes resource materials for the Colac Otway Shire and the wider CCMA regions and consolidates various data sources into a single document.

Whilst the document should not be seen as a complete record of all available information or the only source of information, it does serve as a critical starting point for consultants, municipalities and referral authorities in identifying previous information relating to soil degradation processes in both the COS and the CCMA region.

The use of previous data and information is critical in developing an understanding of spatial distribution, the estimation of likelihood and the understanding of consequence for soil degradation processes. These aspects form the basis of effective hazard risk assessment which in turn is the underlying principle of the proposed standard EMOs to be applied throughout the CCMA region.

5.1.2 Refinement of Susceptibility Mapping for COS

Refinement of the regional susceptibility maps was undertaken by the University of Ballarat taking into account original data sets, GIS techniques, the latest inventory data, process boundaries and scale issues. The refinement of maps expanded on earlier regional scale maps initially prepared at 1:100,000 scale by PIRVic DPI in 2001 and later modified in 2005 as part of a UoB honours project (Feltham 2005a).

Refinement of susceptibility maps for landslides, sheet/rill erosion and gully erosion was undertaken for the entire CCMA region using a GIS statistics based composite index method. A complete description of the modelling process and map refinement is contained in the following document:

- *“Landslide and Erosion Susceptibility Mapping in the CCMA Region”. June 2006. Consultants report No 306/01/06. Prepared for University of Ballarat by A.S. Miner Geotechnical.*

As part of the mapping project outcomes, new susceptibility maps for landslide, sheet /rill and gully erosion were produced specifically for the Colac Otway Shire at a scale of 1:25,000. Limited field checking of the maps was carried out in the COS local government area but was supplemented by correlation of over 150 other sites throughout the CCMA.

The maps represent a significant advancement on the previously available preliminary susceptibility maps produced in either the PIRVic DPI study or the later UoB honours project and are considered to be a good representation of susceptibility for the three modelled degradation process at the intended use of scale of 1:25,000.

5.1.3 Potential EMO Boundaries

A further outcome from the refinement of the susceptibility maps involved the production of the boundaries for the two separate EMO overlays. As such potential EMO boundaries for COS were developed from a consideration of the modelled susceptibility.

The boundary for EMO1 was developed utilising all areas of moderate, high and very high landslide susceptibility. These areas were merged with the areas of all mapped landslide occurrences and then further buffered by 20 m to take account of mapping tolerances and some degree of limited landslide run-out potential.

The boundary for EMO2 was based on all areas of high and very high susceptibility. These areas were again merged with areas of mapped erosion occurrences and buffered by 20 m.

The formulation of EMO2 was undertaken in this manner to take account of a proposed strategic decision to deal with areas of low-moderate and moderate erosion susceptibility through a combination of the use of other overlays and through new provisions within an amended MSS.

5.2 Specific Information Relating to EMO1 (lands subject to landslides)

As previously indicated the proposed implementation of the EMO is planned to include two separate schedules:

- EMO1 (lands subject to landslides).
- EMO2 (lands subject to erosion).

Documents and processes for each were developed throughout the course of the pilot project for the City of Greater Geelong and adapted for Colac Otway Shire. It should be noted that the development of EMO1 proved to be more straightforward as models for its administration and implementation already existed at a number of other Victorian municipalities including the existing scheme at Colac Otway Shire and Yarra Ranges Shire to the east of Melbourne.

As such the documents relating to EMO1 are considered to be more advanced than their counterparts for EMO2. In particular there has been detailed discussion with COS planners on aspects of the EMO1 schedule.

However it is important to note that all documents still require a thorough review and appraisal by COS planning staff to assess their application to specific internal processes.

5.2.1 Schedule to EMO1

A detailed schedule to EMO1 (lands subject to landslides) was developed over a series of workshops and communications with planning staff from CoGG, COS and DSE. The proposed schedule incorporates aspects from a number of existing planning scheme schedules around the state as well drawing on the earlier Phase 2 draft versions.

The final working draft for the EMO1 schedule was prepared by Mr John Keaney under direction from DPI. As with all documents delivered under this project it still requires detailed assessment and appraisal by COS prior to implementation.

5.2.2 Policy on the Use and Application of EMO1

A document designed to provide information on the policy for use and application of the EMO1 was prepared as part of the supporting information aimed at assisting the implementation of EMO1. The document was based on a similar structure to standard Development Control Plans used in NSW and can be used as both a public information document and an internal reference.

5.2.3 Internal Procedures and Guidelines Manual for EMO1

A revision of the existing COS internal procedures manual was undertaken to align it with the alterations to the planning process under the proposed planning scheme amendment. The manual aims to provide a step by step approach to issues relating to the administration of the EMO process and includes checklists and additional public information.

The manual is provided as a guide and framework for an internal process and must be reviewed and assessed by COS for its suitability and application. It must be noted that only limited discussions have been held with COS on this manual to date.

5.3 Specific Information Relating to EMO2 (lands subject to erosion)

Much of the discussion during the CoGG pilot study centred on details for the implementation of EMO1. Issues relating to EMO2 have proven to be more challenging as few workable examples of a planning scheme system relating specifically to erosion exist within the state.

Much of the development work to date has focused on implementing a risk based approach for erosion issues similar to that already well established for landslides. Whilst a new risk methodology was developed for erosion in the CoGG study (see next section) many issues remain to be resolved including that of development versus land use and how to best implement strategic change within the planning scheme.

As a result, limited discussion of the EMO2 issue was completed during the CoGG study and the following documents have been provided in preliminary working draft format only (with the possible exception of the erosion risk methodology). These documents will require detailed discussion and development with COS before a process of administration and implementation of the proposed EMO2 can be finalised.

5.3.1 Discussion Paper on Implementation Options for EMO2

After a series of workshop discussions on various aspects of the EMO2 implementation process, a discussion paper was commissioned by DPI to explore possible options for the introduction of erosion management tools within the CoGG planning scheme. The paper was prepared by John Keaney under direction of the DPI and concluded that a variety of planning strategies should be considered to address issues relating directly to erosion. These included:

- The use of a limited EMO to deal specifically with high and very high susceptibility areas and for specific types of development only.
- The use of existing overlays to deal with other areas of susceptibility.
- The use of the MSS and the newly created Environmental Management Strategy (EMS) to deal with erosion.

Whilst the discussion paper was produced specifically with CoGG in mind the issues are still pertinent to COS and the paper has been included in the deliverables to COS in order to facilitate informed discussion for the future implementation of EMO2.

5.3.2 Development of an Erosion Risk Methodology

Whilst risk management techniques have been successfully applied to landslides in Australia (AGS 2000), the initial work in the CoGG study identified a lack of a consistent framework for the application of risk management techniques to erosion. Whilst some forms of erosion hazard identification and assessment had been developed by the forestry industry and transport authorities, the approaches tend to be specific to the activity undertaken (i.e. road construction projects) and were difficult to transfer to other circumstances.

As a result, a risk based methodology for erosion risk management was developed by A.S. Miner Geotechnical to address the limitations identified in the Phase 1 work of the COGG study.

The proposed methodology was based on the overall approach developed in the Australian Standard on Risk Management (AS/NZS 4360:2004). In addition the proposed method and format was aligned with the risk management concepts and guidelines developed for landslides by the Australian Geomechanics Society (AGS 2000).

The method used the relationship for risk as follows:

$$\text{Risk} = \text{Function (Likelihood and Consequence)}.$$

Likelihood is a function of both susceptibility and triggering events while consequence relates to life, infrastructure and the environment.

A detailed description of the proposed methodology including informative appendices is contained in the following report:

“Erosion Risk Assessment Methodology. EMO Implementation Project for the City of Greater Geelong.” Prepared for Corangamite Catchment Management Authority. Report No 263/01. A.S. Miner Geotechnical, July 2005.

This document was submitted and reviewed by CCMA in July 2005. It now forms part of the integrated framework for the implementation of EMOs within municipalities throughout the Corangamite region and is provided here as a reference document for COS.

5.3.3 Development of a Preliminary Schedule to EMO2

A preliminary working draft of a schedule for EMO2 was developed after a limited number of discussions between DPI, A.S. Miner Geotechnical and John Keaney. No detailed input into the schedule was provided by either COS or CoGG. The preliminary schedule mirrors the structure and process proposed for EMO1 but requires significant review, assessment and confirmation by all stakeholders.

5.3.4 Preliminary Policy for Use and Application of EMO2

A preliminary policy on the use and application of an EMO2 was developed as a working draft document to assist with the implementation of one option for erosion control under the planning scheme. Many issues remain unresolved including the process for referral to a state authority such as DSE to reduce the burden of technical responsibility on COS.

This document requires significant development and review by COS and can only be refined once detailed discussions on EMO2 have been held.

6. Comments and Recommendations

In summary the main deliverables and outcomes under the 2006 EMO implementation project for COS include:

- Refined landslide and erosion susceptibility maps for the entire COS local government area at 1:25,000
- Locations of potential EMO boundaries based on the susceptibility mapping
- A number of general reports relating to susceptibility mapping and data sources
- A series of well developed schedules and associated documents for EMO1
- A series of preliminary schedules and associated documents for EMO2

Outcomes from extensive discussions and development works since the start of the project, confirm the implementation of EMO1 as an appropriate way to deal with issues relating to landslide within the planning scheme. As such maps, a schedule, reports and associated documents allowing for the implementation of EMO1 have been completed and now requires detailed assessment and appraisal by COS.

An assessment of options for control of erosion issues under the planning scheme indicates a series of initiatives may be best suited to this purpose. The development of preliminary maps, a schedule and associated documents have been developed in a working draft format to assist with the further development of an overall strategy for addressing erosion issues.

6.1 Issues Requiring Further Consideration

One of the major issues to date has been the limited opportunity for “hands-on” involvement in the development process for key deliverables by key COS staff at all levels.

The current deliverables now require significant input, review and assessment by COS in order to ensure they comply with current internal policy and resource commitment. This assessment should ideally confirm the commitment established at the start of the project in order to achieve the expectations of both parties under the initial co-investment agreement.

The refinement of the preliminary susceptibility maps has advanced significantly however the current maps are still only considered appropriate for use at a scale of 1:25,000. Detailed discussion of this aspect of the maps is contained in the susceptibility mapping report (see section 6.1.3). The potential EMO boundaries which are based on the susceptibility maps have limits in their accuracy and their application at larger scales commonly used in the planning scheme must be assessed.

It is strongly recommended that such technical issues be clearly defined and discussed with the COS planning staff given the possible requirements for integration of the susceptibility maps and the associated EMO boundaries into the COS GIS system and planning scheme.

Any details of future works and possible further refinement of the maps will ultimately depend on the requirements of the end users.

The COS identified that the development of a web based data repository and distribution system was one of the key elements of the project and a feasibility study was conducted by the CCMA to assess various options for the system. This study concluded that such a system was viable and ongoing development is currently being planned and funding arrangements reviewed. However, due to delays in the initial feasibility study it is unlikely a web based system will be available before next year.

Finally, broader policy and strategic issues still need to be resolved to facilitate the final development of the EMO2. Such issues may include:

- The role of DSE/DPI or another authority as a referral authority for issues such as erosion under the planning scheme.
- Resource and funding arrangement to allow the proposed scheme to function effectively for all municipalities within the CCMA region.
- Application of the model and scheme at a State level.
- Implications of any changes to landslide and erosion risk management guidelines and policy currently being undertaken at a National level.

It should be emphasised that the ongoing cooperation and commitment of both the COS and the CCMA is critical to the successful completion of this project. Further development is required to achieve the final implementation of both the EMO1 and EMO2 for the COS.

6.2 Recommendations

Based on the progress to date and the works completed under the latest phase of the project the following recommendations are made:

- A memorandum of understanding should be immediately developed between the CCMA and the COS regarding the process for implementation of both the EMO1 and the EMO2.
- Timeframes commensurate with any final additional development work required for each of the overlays should be established and agreed upon by both the CCMA and the COS.
- Specific EMO implementation meetings including key stakeholders such as CCMA, DPI, DSE and COS, should be convened as soon as possible to discuss detailed technical issues with all deliverables for EMO1 and possibly EMO2.
- In particular, issues relating to the required scale of mapping and the required accuracy of all EMO boundaries should be clearly defined with all stakeholders
- Meetings with key stakeholders including CCMA, DPI, DSE and COS should be convened to discuss outstanding issues with EMO2. These meetings should include discussion on all options for control under the planning scheme and a

consensus reached on the final strategy to deal with erosion including the status of implementation of EMO2.

- In order to address the limited opportunity for interactive involvement to date, sessions with all levels of the COS planning staff should be organised to explain the proposed process and supplied documentation and to assist with internal arrangements for the administration and implementation of EMO1 in the short term and possibly EMO2 at a later date.
- Given the stated importance of a web based data repository and data access system to the COS, ongoing development of such a system should be discussed with all stakeholders and suitable time frames and funding arrangements confirmed.

Appendix A

Potential Benefits of an EMO

Responsibility and Duty of Care

The obligation for action on issues relating to natural resource management, land degradation and soil health is currently shared between Local Government and CMA's and regulated under a hierarchy of State, Regional and local policy. CMA's have the responsibility to set out land owner duties with respect to managing land and to prepare broad land manage planning and support land protection with detailed projects and programs, particularly where that land is susceptible to degradation process. Local Government on the other hand controls and directs new land use change and development in the landscape having regard to other authority's plans and duties. This is an important process to enable landowner and developers with the best planning and direction to ensure improvements to landscapes whilst generating homes, farms, villages, towns and wealth from the natural landscape.

Municipalities are bound and must have regard to State Planning Policy Framework (SPPF), Regional Catchment Strategies (RCS) and Geographic Strategies provisions of the Victorian Planning Provisions. The CMA and the Municipality share the broad planning role in some instances but the Municipality has the detailed development system in the Local Planning Scheme. When the Council decides on planning permits as the Responsible Authority this role can be sometimes shared because of parallel other state or region authorities policies or activities. This is often formalised through referral to these agencies at the time of a planning permit and enables that authority's concerns or directions to be taken on board. This also reduces the need for separate and further permits of consents to be gained.

Both the CMA and Municipality have a duty of care to coordinate their activities and policies and this is doubly important where erosion and landslide risk exists. The landholder also has a duty of care but public agencies have a high duty of care because of their technical and scientific expertise and statutory duties.

The implementation of an EMO within a municipal planning scheme is one specific tool that can be used to address environmental issues arising out of or impacting upon new development. Interrelated issues of land stability, degradation, soil health, water quality and biodiversity can all be brought to bear in assessing the design, siting and overall proposal to appropriateness of proposals. Whilst an EMO is primarily a tool to regulate development, it can also be used to address issues of infrastructure location, public safety, cultural and heritage issues and offer mapping for strategic planning purposes. Existing development, and development for which a planning permit is not required, will also benefit from the flow effect on knowledge to adjoining land holders and land industries. This leads onto the improved land management practices message that under pin the advice and directions where permits are issued under the overlay. In some cases an EMO can also be used to address current or proposed land use such as agricultural activity. However, this matter has not been canvassed although it is recognised that erosion and as of right land use change are closely related and will eventually need to be examined in each catchment.

Liability

Public and private liability issues can arise out of situations where poor development design and decision making exists and it is important the responsible authorities are continuously improving their knowledge and improving public decision making procedures. Unless continual improvements are made, responsibility will not be diminished or shared equally. Much of the information now relating to land degradation and in particular landslide and erosion now lies within the public arena and needs to be shared and transferred to the professions responsible for land use and development. Significant information sources now include a database being constructed by the CCMA, studies conducted by the University of Ballarat and reports from other State and Federal government bodies such as the former Soil Conservation Authority (SCA). In addition information is also held by the responsible authorities themselves which may not be widely distributed within the organisation itself and this project has sought to align and integrate the best data into clear decision support procedures.

The implementation of an EMO will formalise the data standards, assessment methodology and access arrangements of information through a series of proposed incorporated planning scheme documents such as data inventories. It is also proposed that a centralised publicly accessible web-based system providing ready access to relevant information be established.

The process of dissemination of information is intended to avoid current issues of uneven access to information for geo-technical experts advising on these issues and to improve the up keep of the data sets as we learn more about the changing landscape. Often data systems such as this can be susceptible to being discarded, ignored or forgotten either by the authorities or those conducting the supporting studies and research.

Economic

One of the initial economic benefits of a municipality participating in the EMO implementation program lies in sharing of the initial development costs of the program. It is anticipated that significant elements of the scheme developed comprise a low cost and these in the initial studies can be readily transferred to other municipalities in the region ensuring a consistent planning and development approach across the catchment. For example, the methodology for erosion risk management developed in Phase 2 of the CoGG pilot study can be adopted for other shires. Similarly current developmental work planned by the Colac Otway Shire and the CCMA on a web based information delivery system will benefit CoGG and other shires in the region.

However the major economic benefit of the implementation of an EMO for any municipality will lie in avoiding inappropriate developments in areas of high susceptibility to land degradation. Economic benefit will derive from reduced occurrence of existing or new erosion and its associated impacts both on-site and to receiving environments off-site.

In addition costs benefits will be gained from an anticipated reduction in the number of external peer reviews and associated Victorian Civil Administrative Tribunal (VCAT) arbitration hearings. This particularly applies to developments currently not governed by an EMO or the inadequate addressing of erosion issues under other associated overlays.

The targeted risk areas through the EMO will also ensure the developer addresses land degradation issues at the earliest possible time in the development process and avoid and minimise impacts by following guidelines before planning applications are made.

A Study conducted by the University of Ballarat (Feltham 2005) highlights a significant number of assets within 50 and 100 m of known occurrences of land degradation. Because these mapped occurrences form part of the basis for the final susceptibility maps and associated EMO, it is anticipated that a reduction in inappropriate development adjacent to such infrastructure will occur as a result of the more stringent requirements for development under the newly implemented EMO.

Environmental

Significant environmental benefit is expected to be derived from the implementation of EMOs throughout the CCMA region by providing water quality benefits through the reduction in landslide and erosion. The newly developed erosion risk management methodology clearly identifies the five asset classes commonly adopted by the CCMA (including the environment, flora fauna and biodiversity) as key elements at risk. This ensures such issues are included in any assessment where a report is required under the EMO.

Another significant benefit of the current investment in the healthy landscape program is that the overall CCMA Soil Health Strategy (and the associated program of EMO implementation) provides a consistent approach throughout the region. This can have significant benefit for the environment where natural processes are not governed by local government boundaries and impacts may be experienced far from the source.

Social

The implementation of an EMO is also expected to have significant social benefit. This is likely to occur through a reduction in the risk to life from landslide and inappropriate development in such high susceptibility areas. Much of the coastal public spaces in the CCMA region are susceptible to landslide including parts of the Bellarine Peninsula, and these are particularly under increasing pressure from adjoining residential subdivision and development such as surface and sub-surface drainage changes

Consistent and forward looking planning and regulation can reduce and or avoid the potential for loss of life and damage to what are becoming increasingly more expensive coastal dwellings and infrastructure.