

## PUBLISHED REPORTS - REHABILITATION & ENVIRONMENTAL

[For overseas customers, please include an additional \$50 Australian to cover bank fees, postage and handling costs.]

**REPORT 21 VAN der MOEZEL, P, and BELL, D. T, 1985. "The pre-mining assessment of a coal mining lease north of Esperance, W.A."**

**MERIWA Project 21**

[Fiche \$20, Hardcopy \$120.50, CD Rom \$50]

Prior to any mining operations, aspects of the environment were researched to identify potential limitations in future rehabilitation activities.

**KEYWORDS:** Mining rehabilitation/Melaleuca cymbifolia/solonised soil.

**REPORT 44 FLETCHER, M., MALCOLM, C., PETERSEN, A., JENNINGS, B. and BURNSIDE, D, 1989. "Abatement of dust in the Kalgoorlie region by revegetation of overburden stockpiles"**

**MERIWA Project 66**

[Fiche \$10, Hardcopy \$45.50]

A three year research project into revegetation of overburden stockpiles is described. Overburden from the Golden Mile was found to be moderately to highly saline, highly sodic, compacted, and infertile with widely varying pH's. Species most adapted to these conditions were *Atriplex* and *Maireana*. Resulting from the research, various establishment recommendations are made.

**KEYWORDS:** Revegetation/arid zone/*Atriplex/Maireana*/overburden/open cut mining/saline.

**REPORT 45 BELL, D. T. and LAMONT, B, 1990. "Plant and soil ecology of natural areas and rehabilitated minesites near Eneabba"**

**MERIWA Project 43**

[Fiche \$10, Hardcopy \$62.50]

The research program describes patterns of vegetation and rock conditions in the vicinity of the heavy mineral sands mining operations of Associated Minerals Consolidated Ltd. at Eneabba, Western Australia. Patterns in the natural vegetation and correlation with existing soil characteristics established a foundation of ecological knowledge to help ensure that rehabilitation of the mined lands will ultimately produce a self-sustaining ecosystem of a heathland type comparable to the pre-mining condition.

**KEYWORDS:** Heathlands/ecology/rehabilitation/minesites/heavy minerals.

**REPORT 52 SJAASTAD, LARRY A and THE ECONOMIC RESEARCH CENTRE, UNIVERSITY OF WESTERN AUSTRALIA, 1990. "Exchange rates and commodity prices: the Australian case"**

**MERIWA Project M118**

[Fiche \$5.00. Hardcopy \$37]

The likely effects of variations of exchange rates between the Australian dollar, the US dollar, the Deutschmark and the Yen on prices of four commodities - coal, iron ore, wheat and wool - are considered with the following mean empirical findings:

1. World prices (and the exchange rate) are at least as important as wages in their influence on inflation in Australia.
2. The value of the A\$ is heavily affected by wages and external prices.
3. With the A\$ worth \$US 0.78, the A\$ is overvalued by 4 to 8%. The expectation of a possible devaluation of the A\$ some time in the future helps to explain why interest rates are so high in Australia relative to the rest of the world.
4. Exchange rates account for 12% of the variability of coal prices, 52% for iron ore and 90% for wheat.

**KEYWORDS:** Exchange rates/Commodities/Coal/Iron ore/Wheat/Wool.

**REPORT 66 MENEY, K. A., DIXON, K. W., PATE, J. S. and DIXON, I. R, 1990. "Rehabilitation of mining affected flora"**

**MERIWA Project 98**

[Fiche \$10, Hardcopy \$65.50, CD-Rom \$50]

This study investigates the propagation and rehabilitation requirements of a range of rush and sedge species disturbed by mining, and determines the factors limiting the growth and reproduction of recalcitrant species and methods for ameliorating these factors. Seasonal growth and reproductive biology of selected species are also determined to indicate the time required for rehabilitated areas to achieve acceptable levels of biomass and species diversity. Guidelines are established that will immediately improve the rehabilitation of rush and sedge species in post-mining rehabilitation areas.

**KEYWORDS:** Restionaceae/Cyperaceae/morphology/phenology/propagation/rehabilitation.

**REPORT 84 GILKES, R., KANABO, I., MOSQUERO-PARDO, A., NEWSOME, D and WEATHERLEY, D, 1994. "Utilisation of wastes from synthetic rutile plants"**

**MERIWA Project M122/M208**

[Fiche \$5, Hardcopy \$54]

Synthetic rutile production produces about 0.25 Mt/year of wastes. The two major waste types are iron oxide waste and neutralised acid effluent waste. Glasshouse experiments showed that addition of 5-10% wastes to sandy soils greatly reduced leaching of fertilizer phosphorus and consequently increased plant growth by up to 60%. Field experiments at five locations on the Coastal Plain, using ryegrass, clover and oats, demonstrated that addition of the wastes can increase the effectiveness of P fertilizers.

**KEYWORDS:** Synthetic rutile waste/soil ameliorant/fertilizer.

**REPORT 91 SJAASTAD, Larry A, 1992. "Gold and the exchange rates"**

**MERIWA Project M179**

[Fiche \$5.00. Hardcopy \$26.50]

By analysis of data consisting of spot and forward prices of gold and spot and forward exchange rates of the major currencies, forecast errors can be used to relate price variations to exchange rates. The gold market is dominated by European countries in contrast to the US dollar bloc which has only a small influence. Major gold producing countries have no significant effect on gold prices. The volatility of gold prices is traced back to the Bretton Woods International Monetary System, dissolution of which in 1973 permitted fluctuations in exchange rates among the major currencies with consequent variations in gold price.

**KEYWORDS:** Gold/prices/exchange rates/currencies.

**REPORT 93 CHAMBERS, J. M., FLETCHER, N.L. and McCOMB, A. J, 1992. "The Establishment of Wetland Plants"**

**MERIWA Project M127**

[Fiche \$10, Hardcopy \$59.00]

Fourteen species of sedges, rushes and bulrushes were studied to develop suitable propagation techniques. Rhizome transplantation techniques were developed following trials made at three wetland sites and under controlled conditions at Murdoch University. Seed germination of different species ranged from 0 – 100%. The effects of timing, site of seed collection, temperature and seed pretreatments (seed coat removal, scarification, leaching and boiling) were investigated.

**KEYWORDS:** Wetlands/rehabilitation/sedges/rushes/bulrushes/propagation.

## PUBLISHED REPORTS - REHABILITATION & ENVIRONMENTAL ... Cont'd.

[For overseas customers, please include an additional \$50 Australian to cover bank fees, postage and handling costs.]

<b>REPORT 94</b>	<b>DIXON, K. and NIELSSON, G, 1992. "Post-mining re-establishment of native heaths (Epacridaceae)".</b>	<b>MERIWA Project M129</b> [Fiche \$5, Hardcopy \$51.00, CD-Rom \$50.00]
	Native heaths (Epacridaceae) fail to rehabilitate consistently in sufficient numbers to guarantee a return to pre-mined floristic diversity and biomass. On average, less than 10% of heath species are recovered after mining. A wide range of field, nursery and laboratory experiments were conducted to investigate the causes of poor regeneration and possible remedies. <b>KEYWORDS:</b> Heaths/Epacridaceae/regeneration/propagation/seed biology.	
<b>REPORT 108</b>	<b>RICHMOND, G. S., FOX, J. E. D. and OSBORNE, J. M, 1993. "Factors affecting seed germination in goldfields species of <i>Eremophila</i>".</b>	<b>MERIWA Project M156</b> [Fiche \$5, Hardcopy \$37.50]
	Results of investigations undertaken over a period of 2 years, and covering observations on seed production, viability, germination and ecological characteristics of <i>Eremophila</i> species, are presented. <b>KEYWORDS:</b> <i>Eremophila</i> /revegetation/seed germination.	
<b>REPORT 110</b>	<b>JENNINGS, B., BARRETT-LENNARD, E. G., HILLMAN, B. J. and EMROSE, M, 1994. "Mine waste management in arid areas".</b>	<b>MERIWA Project M135</b> [Fiche \$10, Hardcopy \$44]
	Field trials were conducted on the sponsoring companies mine sites at Leonora, Laverton, Leinster and Mt Magnet. The sites were highly variable, but were mostly alkaline and saline. Seventy plant species were tested in 9 trials over three years. Twelve species (ranked in order of success) are now recommended for revegetation of dumps. Recommendations are made on various soil amendments, time of seeding, seeding rates and ripeline intensity. <b>KEYWORDS:</b> Minewaste/dust/stockpiles/revegetation/arid areas.	
<b>REPORT 111</b>	<b>SCHATRAL, A. and FOX, J. E. D, 1993. "Propagation of forest and heath understorey species: <i>Hibbertia</i>".</b>	<b>MERIWA Project M148</b> [Fiche \$10, Hardcopy \$54]
	The morphology, viability, germination and dispersal of seeds was studied for <i>Hibbertia hypericoides</i> , <i>H.commutata</i> , <i>H.huegelii</i> , <i>H.amplexicaulis</i> , <i>H.serrata</i> and <i>H.cuneiformis</i> . <b>KEYWORDS:</b> <i>Hibbertia</i> /propagation/morphology/viability.	
<b>REPORT 112</b>	<b>ROSSETTO, M., DIXON, K. W. and BUNN, E, 1993. "Integrated conservation of rare flora".</b>	<b>MERIWA Project M193</b> [Fiche \$5, Hardcopy \$39.00]
	The outcomes of an 18-month study designed to develop <i>in vitro</i> propagation and plant sampling technologies, as well as cryostorage procedures applicable to rare and endangered taxa likely to be impacted upon by mining activities, are presented. This study developed <i>in vitro</i> protocols for key, indicative taxa representing the families Myrtaceae, Lamiaceae, Rutaceae, Droseraceae, Goodeniaceae, Haemodoraceae and Proteaceae. The study concluded with a detailed analysis of isozyme and DNA finger printing methods for assessing genetic diversity, developing sampling protocols for propagation and for maintenance of the genetic fidelity. <b>KEYWORDS:</b> <i>In vitro</i> /propagation/shoot tips/germplasm/cryostorage/genetic diversity/rare flora.	
<b>REPORT 116</b>	<b>KYLE, J. H., SKRYPISKI-MANTELE, S. and BRIDLE, T. R, 1994. "Solidification of toxic wastes (with a literature review of the chemical fixation and solidification of hazardous wastes)".</b>	<b>MERIWA Project M163</b> [Fiche \$15, Hardcopy \$79.50, CD Rom \$50]
	This project examines the treatment of arsenic trioxide waste from Windarra and a heavy metal hydroxide sludge from the liquid waste treatment plant at Forrestdale by cement solidification. <b>KEYWORDS:</b> Toxic/waste/solidification/disposal/arsenic/heavy metals.	
<b>REPORT 117</b>	<b>TERRY, K. W. and HEWSON, G. S, 1993. "Retention and excretion of thorium by mineral sands industry employees".</b>	<b>MERIWA Project M211</b> [Fiche \$10, Hardcopy \$46]
	A portable thoron-in-breath unit has been designed, constructed and then used to measure the quantity of thoron exhaled in the breath of employees in the mineral sands industry who have been, or are currently, involved in the operation and maintenance of dry separation plants. A comparison of the thoron-in-breath results to <i>in vivo</i> gamma counting in a conventional whole-body monitoring facility for six employees with elevated thoron-in-breath data was made. <b>KEYWORDS:</b> Thorium/"thoron"/respiration/dusts/mineral sands/mine workers/health.	
<b>REPORT 121</b>	<b>MENEY, K., DIXON, K. and PATE, J, 1994. "Propagation and post-mining establishment of native rush and sedge species".</b>	<b>MERIWA Project M158</b> [Fiche \$10, Hardcopy \$75.50, CD Rom \$50]
	The regeneration biology of a broad range of Australian Restionaceae (Southern hemisphere rushes) and the micropropagation protocols required to achieve successful rehabilitation of post-mined areas are examined. The current taxonomic status of this complex family is also detailed and the new and proposed names for individual species are listed. Habitat preference, fire response, reproduction, seed production and germination ecology, seed longevity and mortality, and the success of embryo culture for micropropagation are all examined. <b>KEYWORDS:</b> Rushes/sedges/Australia/propagation/Restionaceae/morphology/taxonomy.	
<b>REPORT 147</b>	<b>JASPER, D. A, 1995. "Soil microbiology for revegetation, incorporating field inoculation with VA mycorrhizal fungi".</b>	<b>MERIWA Project M204</b> [Fiche 10, Hardcopy \$91.00, CD-Rom \$50]
	Vesicular-arbuscular (VA) mycorrhizal fungi play an important role in nutrient cycling in undisturbed ecosystems, and it is therefore important to restore them when rehabilitating mine soils. Stockpiling of soil results in virtually complete loss of propagules in soil stored deeper than one metre. The loss of propagules is greatest in deep stockpiles stored for a long time. Strategies for stockpile management have been developed. An infective inoculum consisting of dry root pieces prepared from fungi isolated from a range of sites was tested. <b>KEYWORDS:</b> Soil microbiology/VA mycorrhiza/revegetation/inoculation.	

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**REPORT 151 BUNNY, F. and SHEARER, B, 1995. "Biology and ecology of *Phytophthora citricola* in native plant communities affected by mining".** **MERIWA Project M188/M247**

[Fiche \$5, Hardcopy \$47.50, CD-Rom \$50]

*P.citricola* can cause problems in the regeneration of jarrah on rehabilitated bauxite mined pits. A survey showed that *P.citricola* is positively associated with forest roads, with recovery of *P.citricola* declining away from the road into the adjoining forest. *P.citricola* readily produces oospores which enable it to survive in the absence of host material and over extended dry and hot periods *in situ*. The efficacy of phosphonate against *P.citricola* was examined using *Banksia prionotes*, and successfully inhibited lesion development of all isolates tested.

**KEYWORDS:** *Phytophthora citricola*/jarrah forest/sandplains/oospores/taxonomy/phosphonate.

**REPORT 158 WEBSDANE, K., DIXON, K. and SIVASITHAMPARAM, K, 1995. "The impact of smut diseases on rushes and sedges in pre- and post-mining situations".** **MERIWA Project M200**

[Fiche \$15, Hardcopy \$100.50, CD-Rom \$50.00]

Smut fungi infecting Restionaceae (rushes) and Cyperaceae (sedges) in Western Australia were described and, where possible, identified. Both families are important components in the vegetation of sandplain, wetland, woodland and forest habitats, and are important in rehabilitation of mined land. Several new species of smut were identified and described.

**KEYWORDS:** Smut/fungi/rushes/sedges/fungicides/management.

**REPORT 162 HEWSON, G. S. and TERRY, K. W, 1996. "The relationship between respiratory disease and the particle size of dust inhaled by mine workers." Literature Review.** **MERIWA Project M249**

[Fiche \$10, Hardcopy \$42.50, CD-Rom \$50.00]

The literature review was undertaken to establish the current state of knowledge of the dependency of respiratory disease on the particle size of dust inhaled by mine workers, as part of MERIWA Project M249, "Characterisation of Inhaled Dust on Minesites".

**KEYWORDS:** Respiratory disease/workplace dust/mine dust/dust sampling/particle measurement.

**REPORT 163 HUTTON, B., DIXON, K and SIVASITHAMPARAM, K, 1996. "Post-mining recovery of native heaths (Epacridaceae)".** **MERIWA Project M214**

[Fiche \$5.00, Hardcopy \$53.00]

The report provides a sound understanding of an ericoid endophyte associated with members of the Epacridaceae (Western Australian native heaths) in both soil and axenic culture, and describes for the first time a new method enabling resynthesis of the association. It details the occurrence and diversity of native heath - associated ericoid endophytes with special reference to the nature and location of inocula in the soil profile and the effects of soil or vegetation disturbance on the survival of ericoid fungi. Wide occurrence of the endophytic association in most species and high incidence in the roots of host plants suggest it may play a crucial role in the post-mining recruitment of epacrids.

**KEYWORDS:** Epacridaceae/native heaths/post-mining rehabilitation/ericoid fungi.

**REPORT 174 DIXON, K. W., ROCHE, S., MENEY, K. and VON PERGER, B, 1996. "Smoke Enhanced Germination of Native Species for Minesite Rehabilitation".** **MERIWA Project M235**

[Fiche \$10, Hardcopy \$36]

Smoke had been previously implicated as a stimulant to both germination and seedling growth in plant species from similar habitats to many Australian natives. In this project the effectiveness of smoke for germination and seedling growth in some Western Australian species was tested in both glasshouse and field trials. Potential benefits and applications for minesite restoration are presented along with trial results.

**KEYWORDS:** Smoke/Western Australian native plants/germination/rehabilitation/revegetation/minesite restoration.

**REPORT 175 CARSTAIRS, S. A. and STUKELY, M. J. C, 1996. "Rapid identification of species of *Phytophthora*".** **MERIWA Project M227/M254**

[Fiche \$10, Hardcopy \$44.50]

This report sets out methods developed to: 1. increase accuracy of identification of species of *Phytophthora*, 2. increase sensitivity of detecting species of *Phytophthora* in samples retrieved from exploration tenements, 3. determine levels of sampling necessary to achieve given degrees of certainty of detecting *Phytophthora* when present, and 4. reduce the number of "false negatives" for *Phytophthora*.

**KEYWORDS:** *Phytophthora cinnamomi*/species identification/isoenzyme analysis.

**REPORT 179 SUMMERS, R., CLARKE, M. and POPE, T, 1997. "Fertiliser value of a limed gypsum by-product from mineral sands processing".** **MERIWA Project M237**

[Fiche \$25, Hardcopy \$130, CD-Rom \$50]

The effectiveness of a pellitised by-product from mineral sands processing as a sulphur fertiliser in high rainfall sandy areas was successfully measured. The pellets enable sulphur residues to remain in the soil for at least two years providing early season supply which augmented by a fresh application supports production through spring and into the following autumn. The pellets have application in wet untrafficable areas in early spring and probably as a cheap competitor to superphosphate.

**KEYWORDS:** Sulphur/fertiliser/gypsum/superphosphate.

**REPORT 187 BENNETT, I., EYRE, D. and DUFF, B, 1998. "Salt tolerant plants for Goldfields revegetation".** **MERIWA Project M224**

[Fiche \$10, Hardcopy \$48.50]

This report focussed on specific needs of highly salt tolerant plants to revegetate gold mining operations. It specifically addresses five aspects of highly salt tolerant individuals within species known to be halophytic: 1. Selection of field growing material, 2. Clonal propagation of selected individuals, 3. Development of salt tolerant lines, 4. Testing salt tolerance of clonal individuals and 5. Field testing in areas in need of revegetation and with high soil salinities.

**KEYWORDS:** Minesite revegetation/salt tolerant plants/salt degraded land.

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### REPORT 191 JASPER, D A and MERCER, S, 1997. "Mycorrhizal associations of plants in the Eastern Goldfields".

MERIWA Project M250

[Fiche \$5.00, Hardcopy \$25.50]

Mycorrhizal fungi in undisturbed ecosystems in the Eastern Goldfields region were studied in this project to better understand their role and importance to the revegetation of disturbed mine soils. Their symbiosis on plant roots results in increased nutrient uptake with benefits for the plant such as phosphorus uptake, which are lost if topsoil stripping and stockpiling reduce fungi populations. This study supported additional research that investigated response of native plants to inoculated mycorrhizal fungi.

**KEYWORDS:** Fungi/mycorrhizae/rehabilitation/phosphorus uptake.

### REPORT 195 TERRY, K. W., HEWSON, G. S. and ROWE, M.B, 1998. "Characterisation of inhaled dusts on mine sites"

MERIWA Project M249

[Fiche \$10, Hardcopy \$52]

A total of 147 personal cascade samples were taken at eleven minesites in WA covering the major ore types of gold, nickel, alumina, iron-ore, mineral sands, diamonds, industrial minerals and base metals with the following objectives: 1. Characterise particle size distribution of inhaled dust, 2. Compare collection efficiencies as per Australian Standards of past and current inspirable dust sampling heads used within the mining industry. 3. Undertake baseline measurements of diesel particle matter concentrations underground and 4. Characterise important chemical and mineralogical components of dust as a function of size. Several recommendations for improved sampling procedures and standards revisions are based on project outcomes.

**KEYWORDS:** Inhaled dust/diesel aerosol/dust sampling/mining health regulations.

### REPORT 200 WELLS, G and DIXON, K, 1999. "Post-mining restoration of spinifex species in the arid-tropical zone.

MERIWA Project M262

[CD-ROM \$50.00]

Because spinifex grasses were notably absent from rehabilitated areas in the Kimberley, this study of restoration ecology of endemic grasses was made. Its outcomes included confirmation that plants established in post-mine areas exhibited similar to higher survival and growth to natural propagules, and attained limited reproductive capacity earlier than seedlings in undisturbed natural stands.

**KEYWORDS:** Spinifex/*Plectrachne*/rehabilitation/revegetation/smoke-enhanced germination.

### REPORT 208 BREARLEY, J., OSBORNE, J and WRIGHT, I, 2000. "Assessment procedures and end point criteria for arid mine waste rock dumps".

MERIWA Project M277

[Fiche \$20.00, Hardcopy \$180.50

0, CD-ROM \$50.00]

The rehabilitation of waste dumps generated by open-cut mining in Western Australia must be carried out at mine operators' effort and expense. Their need to assess what constitutes successful and sustainable rehabilitation gave rise to this project, in which responses have been developed to planners' questions including: What constitutes success in mine rehabilitation and how can we predict it? Is the regenerated ecosystem sustainable? What objectives will be achievable?

**KEYWORDS:** Mine rehabilitation/sustainability/end point criteria.

### REPORT 209 HARDY, G., DELL, B., COLQUHOUN, I and M<sup>C</sup>COMB, J, 2000. "The potential of the fungicide phosphite to control *Phytophthora cinnamomi* in native plant communities associated with mining".

MERIWA Project M280

[Hardcopy \$51.50, CD-ROM \$50.00]

The foliar application of phosphite was assessed as a practicable, economic and effective way to control *Phytophthora cinnamomi* in native plant communities in Western Australia. Its efficacy in preventing infection and subsequent colonisation of *P.cinnamomi* and in preventing sporulation from infected plants was evaluated and in some conditions both infection and sporulation were prevented or reduced. Appropriate times of year for treatment and side effects on plants were also evaluated, and specific recommendations for the use of phosphite were derived from all the above information.

**KEYWORDS:** Phosphite/*Phytophthora/cinnamomi*/die-back.

### REPORT 214 LYE, P., MURRAY, K., MAY, P., HEFTER, G., LOTZ, R and SCHULZ, R, 2000. "Cyanide Waste Management"

MERIWA Project M309

[Hardcopy \$343.60 Vol. 1-4, CD-ROM \$50.00]

In this AMIRA project a rigorous comparative evaluation of all available methods for cyanide analysis has been carried out. Methods recommended were those that proved reasonably robust and had a data-output with validity across a wide range of different matrices, and these were recommended as best practise. A series of conceptual models of how cyanide behaves in tailings structures is also presented.

**KEYWORDS:** Cyanide/mine waste management/tailings/tailings models.

### REPORT 217 ZEGELIN, S J., CARRAS, J N., COOK, F J., RILEY, K and SMILES, D E, 2001. "The transport of near surface salts in hyper-saline gold tailings and the implications for dust generation by wind action".

MERIWA Project M317

[Hardcopy \$79.50, CD-ROM \$50.00]

This work was undertaken to ascertain from laboratory studies if hyper-saline tailings surfaces will develop into major dust sources if left uncapped, and to measure the dust yield potential of these surfaces after accelerated wetting and drying. The wetting and drying results suggested the surfaces may aid dust inhibition, which led to the recommendation of field trials to assess the applicability of results of this project in the field.

**KEYWORDS:** Hyper-saline tailings/dust yield/wind.

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**REPORT 220 EVANS, L., TSVETNENKO, Y and WOODWORTH, J, 2000. "Improving the precision of ecotoxicity testing protocols for crude oils and drilling fluids".**

**MERIWA Project M290**

[Hardcopy \$67.00, CD-ROM \$50.00]

Because most North West Shelf crude oils are volatile, the internationally accepted toxicity test protocols do not necessarily serve for regulatory application there. This project addressed the deficiencies of these test protocols and of tests for biodegradability of drilling muds. Improved test protocols, sediment reworker toxicity tests and a biodegradation test for drilling muds under tropical conditions were the outcomes of this project.

**KEYWORDS:** Ecotoxicity/biodegradation/drilling fluid/North West Shelf crude/regulatory.

**REPORT 221 TODD, M C L, 2000. "The role of nutrient cycling in the sustainability of young plant communities".**

**MERIWA Project M270**

[Hardcopy \$83.50, CD-ROM \$50.00]

In this study, nutrient cycling (particularly N) within young plant communities on sites previously mined for bauxite in south-west Western Australia was examined, to help mine restoration programs with rapid establishment and maintenance of processes of nutrient cycling. Among the findings is the possibility that a "slow growth" approach to restoration may have preferable long-term outcomes to rapid re-establishment.

**KEYWORDS:** Restoration/rehabilitation/nutrient cycling/sustainability/bauxite mining.

**REPORT 225 ENGLISH, J P., SHEPHERD, K A., COLMER, T D., JASPER, D A and MacFARLANE, T, 2002. "Understanding the ecophysiology of stress tolerance in Australian Salicornioideae, especially *Halosarcia*, to enhance the revegetation of salt-affected lands".**

**MERIWA Project M312**

[Hardcopy \$43.50, CD-ROM \$50.00]

Large areas of Western Australia are naturally saline and host a high diversity of endemic halophytic plants. *Halosarcia* is the genus containing the largest number of halophytic species, which have potential for revegetation use but are poorly known. This project addressed both taxonomic issues and the ecophysiology of selected species for salt and water-logging tolerance, to assess suitability for rehabilitation of varying sites.

**KEYWORDS:** *Halosarcia*/saline lands/rehabilitation/Salicornioideae.

**REPORT 227 ANTHONY, J., PANAI, M., SENARATNA, T and DIXON, K W, 2002. "Somatic Embryogenesis for the production of Australian plants for mining restoration with special emphasis on native heaths (Epacridaceae)".**

**MERIWA Project M321**

[Hardcopy \$79.50, CD-ROM \$50.00]

Synthetic seed technology has been developed for Australian native species that are recalcitrant and are required for land rehabilitation. Restoniaceae/Cuperaceae and Epacridaceae were the key study groups. The project outcomes represent a major achievement in mass propagation techniques for the land restoration industry.

**KEYWORDS:** Australian native flora/land management/minesite restoration/somatic embryogenesis.

**REPORT 230 HAMON, R and McLAUGHLIN, M, 2002. "Nutrient absorption of neutralized acid effluent and blends".**

**MERIWA Project M344**

[Hardcopy \$34.50, CD-ROM \$50.00]

The project and report addressed issues that needed to be resolved in order for neutralised acid effluent to be used, including: which mixtures of materials will provide the greatest sorption capacity for P and N, whether certain environmental perturbations would induce catastrophic release of sorbed nutrients, and nutrient availability in materials to determine their value as slow-release fertilizers.

**KEYWORDS:** Neutralised acid effluent/synthetic rutile/phosphorous adsorption/soil conditioning.

**REPORT 235 DAVISON, E M and TAY, F C S, 2003. "A sampling strategy for *Phytophthora* for "Difficult" sites. MERIWA Project M357**

[Hardcopy \$31.50, CD-ROM \$50.00]

This soilborne fungal pathogen's spread must be minimized by land managers, who impose quarantine and other controls. In this project methods were evaluated to determine the isolation frequency of *P.cinnamomi*, to be used in the land management process.

**KEYWORDS:** *Phytophthora cinnamomi*/isolation frequency/baiting/land management.

**Also refer Report 243 in this section**

**REPORT 242 SCHATRAL, A and OSBORNE, J, 2006. "Management of *Rumex Vesicarius L* on rehabilitated mine sites in the Goldfields of Western Australia".**

**MERIWA Project M332**

[Hardcopy \$70.00 CD-ROM \$50.00]

The annual weed Ruby Dock (*Rumex vesicarius L.*) which rapidly colonized numerous rehabilitated minesites in WA and the NT caused a seasonal erosion problem, where perennial native plants have not established. The research undertaken resulted in an integrated management system to drastically reduce *R. vesicarius* on affected minesites and prevent it spreading, to achieve long-term control.

**KEYWORDS:** Ruby Dock/*Rumex vesicarius*/minesite rehabilitation/ecosystem management.

**REPORT 243 DAVISON, E M and TAY, F C S, 2004. "A sampling strategy for *Phytophthora* for "Difficult" sites. MERIWA Project M357A**

[Hardcopy \$28.50, CD-ROM \$50.00]

Following on from Project M357, a systematic survey determined the isolation frequency of *Phytophthora cinnamomi* and other *Phytophthora* species from the boundary of eight infested areas in southwest Western Australia. These samples were used to estimate the number of samples that must be tested that, if all negative, would indicate an absence of *Phytophthora*.

**KEYWORDS:** *Phytophthora/cinnamomi*/southwest Western Australia/dieback.

**Also refer Report 235 in this section**

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**REPORT 245 O'BRIEN, P and ANDERSON, N, 2004. "The development of a new molecular method for the detection of *Phytophthora cinnamomi*"** **MERIWA Project M361**

[Hardcopy \$33.50, CD-ROM \$50.00]

This project supported a Western Australian researcher in transferring new technology, a microarray system, for use locally in detection of microorganisms including *Phytophthora cinnamomi*. Follow-on work would validate the use of the new microarray system for detecting multiple *Phytophthora* species.

**KEYWORDS:** *Phytophthora*/microarray system/molecular detection/plant pathogen detection.

**REPORT 248 BRENNAN, K., MAJER, J., and NICHOLS, O, 2005. "Innovative techniques for promoting fauna return to rehabilitated sites following mining".** **MERIWA Project M362**

[Hardcopy \$52.50, CD-ROM \$50.00]

This study began with a survey of techniques current in the Australian mining industry for re-colonising rehabilitated mined land with appropriate fauna. It then went on to review potential benefits of these techniques and to recommend which techniques should be most vigorously pursued. The latter include control of feral predators, re-establishment and conservation of tree hollows, and addition of habitat logs.

**KEYWORDS:** Rehabilitated mine site/recolonisation/arboreal hollows.

**REPORT 254 PARSONS, M, 2005. "Selective herbivory by kangaroos in mined land".** **MERIWA Project M350**

[Hardcopy \$47.00, CD-ROM \$50.00]

To counter-act the selective herbivory by western grey kangaroos (WGK) on re-vegetated mine sites, plant assessments and animal behaviour experiments were combined in this study. The numerous outcomes included demonstration that WGK are more browsers than grazers, that herbivory was the most important environmental stress on the plants and that salts and tannins in plants are avoided by WGK.

**KEYWORDS:** Western grey kangaroos, herbivory/mine site re-vegetation/ rehabilitation.

**REPORT 258 INGLIS, T, 2006. "The occupational health risk of melioidosis in the mining industry".** **MERIWA Project M354**

[Hardcopy \$22.00, CD-ROM \$50.00]

The potential of occupational melioidosis was studied in staff at a Western Australia minesite, where small percentages showed evidence of exposure, some of recent exposure. Evidence was not found for overt infection attributable to on-site exposure, suggesting several pro-active measures have reduced exposure risk on-site.

**KEYWORDS:** Melioidosis/on-site exposure/Western Australia/occupational health.

**REPORT 261 PARSONS, M., MELLA, V., DODS, K., LAMONT, B and DAVIES, S, 2006. "The use of novel deterrents for reducing herbivory by kangaroos: A multidisciplinary assessment".** **MERIWA Project M383**

[Hardcopy \$47, CD-ROM \$50.00]

The project was set up in a series intended to provide the impetus for expensive, long-term studies of fear ecology. Intended outcomes were to determine whether wild kangaroos would be deterred to the same extent as captives by predator waste products, and the formulation of a timed-release gel for use on Australian minesites.

**KEYWORDS:** Western grey kangaroo/kangaroo herbivory/minesite re-habilitation/Australian bush re-vegetation.

**REPORT 264 MENGLER, F., GILKES, R and HANCOCK, G, 2007. "Erosion resistant landform design for steep slopes in rehabilitated bauxite mines"** **MERIWA Project M375**

[Hardcopy \$90.50, CD-ROM \$50.00]

The study was planned to answer questions including: what is the maximum slope angle that can be safely mined and rehabilitated using standard practise? And which of many erosion simulation models can be used as a tool to predict erosion risk? These and other slope rehabilitation issues were addressed to inform decisions on criteria governing the regulation of such practises as well as achieve the needed outcomes. All the objectives were met, assisting both companies and regulators, and are thoroughly documented in the report.

**KEYWORDS:** Bauxite mining/slope stability/slope rehabilitation/landform design/RUSLE model.

**REPORT 265 DAVISON, E., WARTON, B and TAY F, 2007. "Use of metham sodium to eliminate *Phytophthora* from roading gravel".**

**MERIWA Project M378**

[Hardcopy \$31.00, CD-ROM \$50.00]

Treating gravel with metham sodium to kill *Phytophthora cinnamomi* was investigated in this study, with the intent to develop more gravel sources that would be free of dieback fungus. The positive results enabled an application to be made to the Australian Pesticides and Veterinary Medicine Authority to register metham sodium to treat gravel.

**KEYWORDS:** Metham sodium/road gravel/*Phytophthora cinnamomi*/dieback.

**REPORT 268 de KLERK, N., and MUSK, A, 2007. "Radiographic silicosis and lung cancer in Kalgoorlie goldminers".**

**MERIWA Project M289**

[Hardcopy \$22.50, CD-ROM \$50.00]

This project met all its objectives, which were to determine the incidence in former gold miners of radiographic silicosis, to relate this incidence according to the ILO Pneumoconiosis Classification to indices of exposure to silica, and to establish the relation between radiographic silicosis and lung cancer in these goldminers.

**KEYWORDS:** Goldminer, silicosis, pneumoconiosis, lung cancer.

## PUBLISHED REPORTS - REHABILITATION & ENVIRONMENTAL ... Cont'd.

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<b>REPORT 270</b>	<b>GREGORY, S, 2008. "The classification of inland salt lakes in Western Australia".</b>	<b>MERIWA Project M379</b> [Hardcopy \$92.00, CD-ROM \$50.00]
<p>The project's aim was to develop a classification system for inland salt lakes, which may be used by the mining industry to dispose of excess water, in Western Australia, based on abiotic and biotic factors. Lakes with unique or significant features would thus be indicated, and the resulting classification serves as a predictive tool to determine the impact of dewatering discharge within the Goldfields of Western Australia. <i>KEYWORDS:</i> Salt lake/mine waste water/Western Australian Goldfields/mine dewatering/ANZECC.</p>		
<b>REPORT 271</b>	<b>ONG, C., LAU, I., HEWSON, R., TONGWAY D, and EISELE A, 2008. "The development of a hyperspectral environmental measurement tool for monitoring mining related infrastructure and rehabilitation"</b>	<b>MERIWA Project M385</b> [CD \$50.00]
<p>Based on three test sites selected to span the different climatic conditions found across Western Australia, this project aimed to demonstrate the potential of next generation remote hyperspectral sensing technologies to accurately and efficiently monitor critical environmental measures and indicators used in the mining industry. <i>KEYWORDS:</i> Hyperspectral/environmental monitoring/dust mapping/Landscape Function Analysis/rehabilitation monitoring.</p>		
<b>REPORT 272</b>	<b>HIDAYATI, S., TURNER, D W., MERRITT, D J and DIXON, K W, 2008. "A physiological and biochemical basis for seed storage for biodiversity conservation and restoration"</b>	<b>MERIWA Project M372</b> [Hardcopy \$71, CD \$50.00]
<p>The project goal was to produce a scientific basis for the effective long-term storage of Australian floral species of proven value in conservation and restoration activities. It also focused on species representative of endemic Western Australian families and genera and also those with unknown seed biology. <i>KEYWORDS:</i> Western Australian flora/seed storage/biodiversity conservation/biodiversity restoration/seed bank.</p>		
<b>REPORT 273</b>	<b>ADAMS, M., DONATO, D., SCHULZ, R and SMITH, G, 2008. "Cyanide ecotoxicity at hypersaline gold operations".</b>	<b>MERIWA Project M398 I &amp; II</b> [Hardcopy \$319.00 incl. Vols. I, II, III & Appendices, CD-ROM \$50.00]
<p>Two working hypotheses to account for absence of wildlife deaths at hypersaline tailings dams were derived from a longer list of nine. In the second phase of the work one of these was modified slightly, and the additional chemical and ecological data from Phase I allowed testing against two mathematical models of cyanide degradation, and admissible explanations of the observed lack of wildlife mortality. <i>KEYWORDS:</i> Hypersaline tailings/cyanide degradation/cyanide ecotoxicity/gold processing/wildlife mortality.</p>		
<b>REPORT 277</b>	<b>HERATH, D., LAMONT, B., ENRIGHT N and MILLER B, 2008. "Successful rehabilitation of species-rich heathlands after mining for heavy minerals".</b>	<b>MERIWA Project M364</b> [Hardcopy \$51.50, CD-ROM \$50.00]
<p>The project objective, to evaluate the ecology of rehabilitated minesites, was met by comparing the sites' plant species compositions, spatial arrangement, functional attributes and response to experimental fire with those of the surrounding heathlands. <i>KEYWORDS:</i> Rehabilitation/revegetation/heathland/heavy mineral mining/ experimental fire.</p>		