WorleyParsons
resources & energy

EcoNomics™

Select

Minerals & Metals Capability and Experience

WorleyParsons

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"There is no task so important or so urgent in our business, or our customers' businesses, that it overrides the need to work safely..."

John Grill, WorleyParsons CEO

Zero Harm is our corporate vision for health, safety & the environment (HSE).

We are committed to our vision; it applies to all of our operations, at all times, in all locations, and at all levels of responsibility.

We will actively work to align our expectations and behaviors with those required to achieve our vision through a dedication to continuous improvement.

The launch of our HSE framework, OneWay™, enables us to further align and consolidate our global systems and procedures and continue to work with our personnel to reinforce a culture that underpins our drive to achieve our corporate differentiator of industry leadership in the HSE performance.

OneWay™ to zero harm

Corporate Overview

WorleyParsons is a leading global provider of professional services to the resources & energy sectors, and the complex process industries.

We cover the full asset spectrum, both in size and life cycle, from the creation of new assets, to services that sustain and improve operating assets.

Our business has been built by working closely with our customers through long term relationships, anticipating their needs and delivering inventive solutions through streamlined, proprietary project delivery systems. Strong growth continues to characterize our performance both through organic development and through strategic acquisition as we strive to provide tailored services wherever our customers need us.

- Minerals & Metals
- Power
- Hydrocarbons
- Infrastructure & Environment

37
countries

114
offices

31,700
personnel

EcoNomics™ Delivering profitable sustainability

EcoNomics™ is our range of services and technologies that profitably embed environmental, social and financial sustainability into project delivery, across the asset lifecycle. It is a seamless extension of our established project delivery capability in the key areas of Assessment, Efficiency, Treatment and Mitigation.

We are committed to working with our customers to turn their sustainability objectives into good business practice.

EcoNomics™

WorleyParsons *Select*

Minerals & Metals *Select* is the specialist front-end division within WorleyParsons, focused on project viability assessment and development concept selection. *Select* supports decision making on critical front-end planning issues that enhance our customer's ultimate business objectives.

WorleyParsons operates in all five phases of an asset's lifecycle with our tailored business lines, *Select, Deliver* and *Improve* responding to our customers' individual needs in each project phase. *Select* brings real world experience into the front-end value adding phases to maximise investment return and underlying confidence. *Deliver* converts the highest potential value option identified by the *Select* division into a fully defined and successfully executed project. *Improve* supports and enhances customers' assets throughout the operating lifecycle.

Minerals & Metals *Select,* through its focus on the critical early phases of projects:

- Adds technical definition to reduce technical risk
- Optimizes the opportunity and maximizes the inherent value
- Creates the business case and assesses the probable life cycle costs
- Assists the customer in securing the necessary approvals and prepares for the *Deliver* business line

Through *Select*, we advise asset owners, operators, investors, financial institutions and governments on the best path forward by combining the niche specialist skills required within the front-end of projects with WorleyParsons' extensive, practical experience in total project delivery and plant operation. Minerals & Metals *Select* utilizes a global database of major capital projects to enable customers to make strategic investment decisions with accurate and reliable planning data, significantly increasing their confidence that the critical planning decisions will underpin their ultimate business objectives.

Our specialists have a thorough understanding of the total business value chain including market analysis, financial modelling, technology selection, greenfield site selection, approvals management, new plant configuration, existing plant optimizations and the development of the detailed project realization methodologies. The combination of strategic front-end planning skills integrated with extensive project execution capabilities, together with WorleyParsons' technological and commercial neutrality, differentiates Minerals & Metals *Select* in the consulting market as a market leader.

Technological and commercial

independence

Cost estimates for projects from

20k-20b

total installed cost

2,500+

studies per year

WorleyParsons' Project Phases

WorleyParsons' experience covers all five phases of the asset lifecycle. In each on of these phases we understand the critical issues and apply our specialist business lines, *Select*, *Deliver* and *Improve* to enable our customers to achieve their business objectives.

Our phased approach enables consistent project delivery worldwide and WorleyParsons' project systems are fully aligned to this process.

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Services

Technical Development

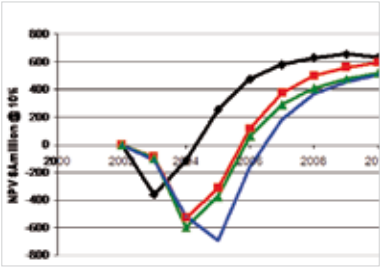
Through the course of a *Select* study, specialist engineering staff add technical definition to the development concepts identified within the initial framing workshops. Traditionally this technical definition is constrained by the lack of data available on which to base a design. *Select* makes use of the extensive database of current design projects and archives of existing facilities to gain the analogues from which to quickly assemble the concepts for screening. Technology selection studies are undertaken from the company's stated position of technology neutrality, to provide our customers the information they require to compare the 'tried and tested' with the risk weighted 'new and emerging'.

Value Adding

Phases 1 and 2 (Identify and Evaluate) are recognized as the major value adding phases. It is within these phases that the opportunity to find the up-side of the development cases is found. *Select* works best by forming an integrated team with the customer's staff bringing technical development in line with operational know how to identify the areas of value enhancement. *Select* makes use of formalized Value Improving Practices to ensure our customers achieve the maximum possible front-end loading within the constraints of the development schedule and budget.

Business Model Creation

Select assists in the creation of the required Business Models in a number of ways. Firstly, by the creation of the Capital Expenditure (CAPEX) estimates using proprietary in-house tools designed to quickly assemble building block style estimates validated from past projects using up-to-date base rates. Secondly, *Select* typically works with our customers to build the ongoing Operating Expenditure (OPEX) models to enable the life cycle cost comparisons between competing development options to take place. Lastly, *Select* can provide risk based Net Present Value modelling using the EcoNomics™ DELTΔ tool. This modelling can include additional externalities (such as carbon taxes) for customers seeking to future proof their businesses by analyzing a broader range of possible futures.



Project Planning

The forming of the Decision Support Package (DSP) is the closing phase of *Select*'s work and provides the beginning foundation for the *Deliver* phase. The DSP contains all required information upon which the decision to proceed with the project is made. The project execution planning skills of the broader WorleyParsons organization are made available through *Select*, giving our customers access to detailed planning engineers, senior procurement staff and field construction personnel. This enables *Select* to provide services such as Execution Strategy formation, long lead item identification and construction logistics planning by staff expert in these fields.

Sub-Sector Overview

Aluminium

Our aluminium group is recognized as one of the aluminium smelting industry's strongholds as evidenced by our presence across major projects and operations support alliances, as well as being a provider of specialist consulting services in reduction, raw materials handling, automation / control, cast house and power.

Bauxite & Alumina

WorleyParsons has in-house bauxite and alumina technical design capabilities which, when combined with our breadth of major project delivery experience, underpins our full range of services from concepts through to project realization and operations support. Our Bauxite & Alumina team is a global leader in alumina refinery process design and is experienced in all facets of modern refinery operation. The group also has substantial Bayer process modelling and concept development capabilities.

Base Metals

We have a significant and strong reputation within the base metals industry for the successful delivery of all components of entire mineral resource projects and for upgrading and optimizing existing process plants. WorleyParsons' Base Metals worldwide group brings together a team of highly skilled professionals with extensive base metals operating and project implementation experience, who are able to provide the full project evaluation and project execution expertise required to successfully deliver projects in the copper, nickel, zinc, lead, uranium and gold industries.

Chemicals

WorleyParsons recognizes the proprietary nature of many chemical processes and has the ability to enhance them with innovative engineering design, while preserving intellectual property rights, technical integrity and customer and licensor confidentiality. We have extensive experience in the assessment and development of projects and technologies in the fertilizer and specialty chemicals sectors and are a recognized leader in engineering design and total project delivery solutions to the chemicals industry.

Coal

WorleyParsons has strong experience across several continents in coal mining, processing and materials handling. Our coal industry technical specialists and our major project delivery capability together support the company's offering in major coal project development.

Iron Ore

With capabilities in major project infrastructure as well as iron ore processing, the WorleyParsons Iron Ore team provides total mine to market engineering and project delivery solutions for iron ore project developments. The team has extensive experience in aspects of the iron ore supply chain, including mine site planning, ore processing plant design, transportation design such as rail and road, port design and overall logistics planning and optimization.

Ferrous Metals

Our strong long-term relationships with industry leaders in the steel industry have given our people the experience necessary to provide comprehensive operations support and project development services. Our experience covers ferrous metals processes for steel manufacturing to downstream manufacturing of steel end products.

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Strategic Investment Decision Support

Access to current cross industry experience and a global database of major capital projects enables customers to make strategic investment decisions with accurate and reliable planning data.

Our *Select* personnel understand the importance of selecting the optimum project solution during the formative phases of a project. We recognize that by doing this, we add the greatest value to the project for our customers, by assisting them to achieve their goals and create a sustainable and profitable operation.

Select's services are designed to meet our customer's business needs for both new and existing facilities. This starts with identifying business opportunities and carries on to comparative reviews of existing and emerging technologies from a technology neutral position. This allows us to work with our customers to present the widest range of available options and select the most appropriate technologies for their projects.

Once opportunities have been identified they are screened for viability. *Select* personnel undertake project cost and scheduling analysis, including screening and ranking, to determine relative option costs based on a combination of CAPEX and OPEX modelling, thus enabling life-cycle cost analysis to be undertaken. Our ability to include market side economic forecasting and detailed financial modelling services using third party fuel, commodity, and material escalation forecasting databases provides our customers with an insight into the effects future external conditions will have on the profitability of their operation.

All through this process, *Select* guides customers towards making only the key decisions that are essential in the early stages of a project. This strategy enables customers to reduce execution risk and improve cost and schedule performance, whist retaining flexibility in areas where ongoing uncertainty will have no significant adverse affects on the final project outcome. This is particularly relevant in markets that are subject to change.

For projects where master planning is required, our key strength lies in our ability to assemble multidisciplinary teams lead by experienced master planners capable of integrating all aspects of the project, reducing contractor interfaces, and producing a framework for sustainable future development. Our knowledge and first hand experience of the Minerals & Metals industries also enables us to offer independent advisory services including due diligence, engineering and technical support to the banking and investment sectors.

40+
years minerals & metals experience

25b+
assets supported by long term contracts




Project: **Moly Mines Prefeasibility**
Customer: **Moly Mines Ltd**
Phases: IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Australia

Moly Mines Limited commissioned WorleyParsons to complete a prefeasibility and feasibility study for their Spinifex Ridge molybdenum/copper deposit in the Pilbara region of Western Australia.

The study examined a base case of 12 Mtpa throughput plant, and an alternative 15 Mtpa plant. Both cases envisioned using a conventional flotation process. Worleyparsons developed capital and operating cost estimates for the processing plant, together with process flow diagrams, mass balances and plant layouts to support the estimates.

Project: **Due Diligence for UC Rusal Aluminium Industry Assets**
Customer: **Rusal and Glencore**
Phases: IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Global

Both Rusal and Glencore selected WorleyParsons to undertake a due diligence of both companies' aluminium assets in preparation for, and as part of, a merger of assets to form UC Rusal, one of the largest integrated aluminium companies in the world. The due diligence covered eight alumina refineries and four smelters in five different countries. The due diligence included a review of technologies employed, operating efficiencies and reliabilities, logistics to market, operating and sustaining cost forecasts and general sustainability of the businesses. WorleyParsons was selected on the basis of our comprehensive understanding and presence in the aluminium industry.

Project: **Olympic Dam Expansion (ODX) Project**
Customer: **BHP Billiton - Olympic Dam**
Phases: IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Australia

WorleyParsons, in a joint venture with SNCLavalin (WPSL), was commissioned to carry out a pre-feasibility study of the Greenfields expansion of the existing Olympic Dam facility. It is envisaged that the project will involve a move to an open-pit mining method, a four fold increase in copper capacity and trebling the uranium capacity, requiring an investment in excess of US$5 billion. The pre-feasibility study for the Ore Processing Facility covered new facilities for the concentrator, hydromet and uranium extraction, smelting, refining and utilities required for plant operation. WPSL also completed evaluation studies for greenhouse gas mitigation, on-site power generation, gold recovery optimization, hydromet process improvements and smelter optimization and debottlenecking.

Project: **Serra Sul Iron Ore Mine**
Customer: **Vale**
Phases: IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Brazil

The project encompasses the development of the Serra Sul Mine in Brazil's Amazon to produce 100 Mtpa of iron ore. Included in the project are a beneficiation plant, extension/double-tracking of railway lines and expansion of the port facilities at Sao Luis. WorleyParsons has developed modularization strategies for the beneficiation plant and the port expansion using 3D PDS models, completed detailed studies for procurement of equipment and pre-fabricated modules from China, Brazil and other international sources including a detailed Logistics and Infrastructure study and has also developed an Execution Plan for the project.

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Opportunity and Risk Management

Key to maximizing value and return on investment through successful project implementation is the early identification of project risks - bounding the down side while continuing to add value through identification of upside opportunities.

We understand that our customer's objectives are often a balancing act of financial, technical and broader societal goals, opportunities and risks. Project Risk Management seeks to identify both threats and opportunities that can impact on a project successfully meeting its objectives. These objectives are defined for each project and may include schedule, budget, quality, safety and the environment. WorleyParsons has a structured project risk management program that is a key component of our project management delivery model. This enables project teams to work collectively with our customers and appropriate stakeholders to identify, prioritize and effectively manage both threats and opportunities to enhance project success. This is an ongoing process that enables new risks to be identified due to changes in the project scope or project conditions.

Reducing costs is one way to minimize expenditure; another important aspect is the ability to provide dependable, realistic and accurate project estimates. WorleyParsons benchmarks projects against industry best practices to provide our customers with greater certainty over capital outlay and schedule expectations.

The complex nature of brownfield sites also presents many opportunities for our skilled personnel to perform feasibility studies to debottleneck plants. This results in an increased output with minimum capital expenditure providing the best return on investment for our customers. We also achieve a similar outcome for both greenfields and brownfields opportunities, using value engineering to review concepts and original designs at a high level, to ensure they don't include unnecessary steps, components or features. This ensures the essential scope functions of safety, performance, reliability, quality, maintainability, aesthetics, and asset protection are met at the lowest total cost.

Specific services include:

- Brownfields optimization studies
- Project review and risk assessment (including quantitative techniques to monetize non-financial risks)
- Analysis of non-financial risk (EcoNomics™)
- Managing environmental issues and statutory approvals processes
- Value Enhancement processes and studies

500+
major greenfields and asset optimization studies performed

1000+
brownfields performance enhancing projects globally




Project: Noranda and RUSAL
Customer: Xstrata and Glencore
Phases: IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Russia

WorleyParsons identified a gap between current operations and benchmark performance and made recommendations for improvement.

WorleyParsons undertook reviews of the four RUSAL aluminium assets in Siberia. The scope included: Assessing the physical state of assets and operational and performance quality; Reviewing maintenance and operations and the major production processes to identify key bottlenecks/constraints and technical risks; Reviewing the reserve position, mine planning/operation and environmental issues; Comparing commercial performance against a built up operating cost mode; Comparing the plant performance to industry norms and benchmarks.

Project: Comalco Alumina Refinery (CAR) Project
Customer: Rio Tinto
Phases: IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Australia

The Comalco Alumina Refinery produces 1.4 million tons per annum and is the first new Western world Greenfield refinery to be developed from start to finish in more than 20 years. Our association with the project began with its inception and carried through to the development process and operations. Following previous feasibility studies a change in the methods of determining all aspects of project scope was required to provide the desired outcomes for the project. WorleyParsons' engineers worked side-by-side with Comalco's business consultants to develop rigorous new processes for identifying, evaluating and "locking-in" project solutions aligned to maximizing return on capital, and then to implementing these processes to facilitate optimized, business-case driven project outcomes.

Project: Coal Mine Due Diligence, Pre-feasibility and Feasibility Study
Customer: Confidential
Phases: IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Canada

At the request of a confidential client, WorleyParsons provided a due diligence review in support of our client's acquisition of an existing coal mine. The due diligence review included an assessment of:

- identification of potential environmental concerns and next phases of investigations
- existing infrastructure on the facility and potential upgrades required to on-site facilities to increase production targets as per the customers requirements
- potential alternative transportation routes from the sites to increase the economic viability of the project

Project: Kennecott Utah Copper
Customer: Rio Tinto
Phases: IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

United States of America

Kennecott Utah Copper mine is 2¾ miles wide and ¾ of a mile deep and has produced more that 18.1 million tons of copper since first opening, making it the largest copper mine in the world. WorleyParsons and HG Engineering were engaged to complete a preliminary constraints study on the operation of the flash smelting and flash converting operation. The project initially identified the bottlenecks and the original plant PFD's were marked up to show the current status. After completing this report the second phase of the project determined the capital cost of implementing the necessary changes to debottleneck the operation.

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Seamless Project Realization

WorleyParsons through its *Select, Deliver* and *Improve* business lines has proven systems and technical capability to successfully bring together the experience and knowledge gained in all phases of project development to provide customers with a complete project implementation solution.

Select is an integral part of the WorleyParsons' global Minerals & Metals delivery capability. Our services are a valuable addition to any project but we also realize that they are only part of the services required to take a project from conception to completion. With this in mind *Select* endeavours to provide packages of complete, clear, and concise information that enables seamless transition into future phases of projects.

As projects move into subsequent phases WorleyParsons has specific services to ensure their success. These services include structured processes to turn an idea into reality, project assurance processes to successfully deliver projects, global reach and local delivery, and industry specific project realization strategies. These project realization strategies have been developed to incorporate high value engineering providing cost effective access to skilled resources, global procurement strategies supporting local personnel with experience to ensure quality and minimize lead times, fabrication and installation logistical strategies (eg modularization) to optimize schedule and access specialist labour forces. These services are executed through our *Deliver* and *Improve* business lines.

Delivering from concept to completion - The *Deliver* business line operates across the Define and Execute project phases to realize the highest potential value options identified by the *Select* service and turn them into fully defined, safe and successfully executed projects, realizing maximum value for our customers. Our ability to deliver projects, ranging from small studies through to mega-projects, is a key differentiator. The WorleyParsons Project Management Process, part of our global Enterprise Management System, provides a scalable, risk-based framework for project execution, and ensures the quality, efficiency and consistency of our project delivery approach – regardless of size or location.

Continuous improvement for our customers - WorleyParsons' *Improve* delivers major projects, upgrades, de-bottlenecking, maintenance projects, project portfolio management and support services to sustain assets and improve business performance of Brownfield operations. Following a project's transition from execution to operation, our customers constantly monitor, maintain and improve the performance of their assets to maximize their long-term value. WorleyParsons' *Improve* provides a comprehensive suite of services to assist with the achievement of operational and performance objectives within a Brownfield operating environment.

Global
experience

170+
EPCM projects greater than $100 million




Project: Aughinish Optimization Project
Customer: Aughinish Alumina Limited (AAL)
Phases: IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Ireland

Following earlier WorleyParsons concept studies which helped identify innovative ways of optimizing the existing operation AAL engaged WorleyParsons to further develop their Production Capital Program.

This work culminated in a feasibility study and sanctioning of a brownfield project comprising modifications and upgrades to 38 different systems within the refinery to delivery more than 15% additional capability. WorleyParsons was subsequently engaged to delivery the project on an EPCM basis. Working closely with the AAL team ensured a successful project which met or exceeded the overall project objectives in safety performance, project budget and schedule and capacity effectiveness.

Project: MATCH
Customer: Evonik Industries
Phases: IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

China

Evonik Industries, whose chemicals business was formerly known as Degussa, is developing a Greenfield integrated methyl methacrylates and methacrylate specialities production plant in Shanghai, (known as MATCH). This world-scale facility will produce products to supply the optoelectronics, paint and adhesives, and automobile industries. MaisonWorleyParsons commenced early in the project, as part of an integrated team to support the government approval process and develop a preliminary design package. Involvement continued through basic engineering and the provision of EPCM services for the process units and all related infrastructure and utilities. The total site workforce is expected to peak at 2,500 people before completion in 2009.

Project: Yarwun 3 Project
Customer: Orica
Phases: IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Australia

The Yarwun 3 Project included a new 300,000 tonnes/annum Ammonium Nitrate Prilling plant (AN), a relocated 650t/d Nitric Acid Plant, from Denmark (NAP3) and OBL Facilities including a Boiler, Cooling Tower, AN Bulk Store, Ammonia Storage and Brownfield Tie-ins. WorleyParsons was selected by Orica as the preferred EPCM Contractor for the FEED and Execution phases. Upon successful completion of the FEED we commenced detailed design in January 2005. Construction of the Nitric Acid Plant was completed in April 2006 and the Ammonium Nitrate Plant was completed in June 2006. Commissioning of the plant was completed in early July 2006. The project was taken from concept to operation in 23 months and from sanction to operation in 19 months. This was a major success in a very tight market.

Project: Mufulira Smelter Upgrade, Phase 2 – Fire Refining & Casting
Customer: Mopani Copper Mines
Phases: IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Zambia

Mopani Copper Mines upgraded its Mufulira Copper Smelter to reduce emissions and increase concentrate treatment capacity from 420,000 tpa to 850,000 tpa. WorleyParsons provided the basic and detail engineering, construction management and commissioning assistance for phase 2, which comprised the installation of a refining and casting plant designed to handle anode copper. Commissioning utilized a team of WorleyParsons international staff and locally hired engineers and technicians. This logistically challenging and complex project was successfully managed despite Zambia's land-locked position, limited access to qualified resources and major safety, quality and performance concerns.

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Mine to Market Solutions

The successful delivery of major greenfield resource developments involves the efficient combination of numerous interrelated project elements into a safe, fully integrated and cost effective production operation.

Typically the total development will encompass the construction of a new mine site and related resource processing facilities, often in a remote location, and the construction of the rail and port infrastructure required to transport finished product and supplies to and from the mine and processing facilities. WorleyParsons extensive experience in both the Minerals & Metals and Infrastructure & Environment sectors enables us to provide customers with a project delivery capability that spans all of the project elements – from mine to market.

Our diverse skills and knowledge have been applied to some of the resource industries most challenging project environments, ranging from the greenfield iron ore developments in remote regions of Western Australia and Africa, through to oil sands projects in Canada and the development of the world's largest phosphate and fertilizer complex in Saudi Arabia.

Our ability to take complete responsibility for these projects from 'mine to market' enables WorleyParsons to take a holistic view of all elements and seek out opportunities to reduce interfaces, capital cost and lead times whilst simultaneously optimizing the total performance of the operation.

Specific services include:

- Mine site planning and development
- Delivering complex process technologies
- Supporting infrastructure including rail, terminal and import and export facilities
- The development of fast track project execution methodologies
- Assistance with obtaining environmental and other statutory approvals
- Global procurement sourcing to assist in achieving cost and schedule targets
- Development of off-site fabrication and modularization implementation strategies

Projects in
27+
countries

30+
years experience in mining infrastructure

1000+
global personnel engaged in the delivery of mineral processing plants




Project: Pilbara Iron Ore Infrastructure Project
Customer: Fortescue Metals Group (FMG)
Phases: IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Australia

In May 2008 with the assistance of WorleyParsons, the ambitions of Fortescue Metals Group to establish a new iron ore operation were realized when the first shipment of iron ore departed Port Hedland headed for China.

The project involved the construction of an open-cut mine, 256 km single-track railway, airfield, accommodation camps for a construction workforce and the development of new port facilities at Port Hedland. WorleyParsons Minerals & Metals and Infrastructure & Environment customer sector group's involvement started with the feasibility study and continued through to project completion. WorleyParsons enabled Fortescue to meet its ambitious construction time frame despite the remote project sites, challenging project environment and fierce competition for physical and human resources in a boom economy.

Project: Mbalam Iron Ore Project
Customer: Sundance Resources
Phases: IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Cameroon

WorleyParsons undertook a concept study for the project development, including preliminary engineering and design for a 35 Mtpa mine site, 250,000 DWT export facility, 517Km connecting railway and all associated support facilities and the entire infrastructure required to successfully construct, commission and operate the plant. This included: the mine process plant; mine utilities; rail and rail corridor; port facility and roads. The study report included all supporting reports and sketches necessary to adequately substantiate the Class 1 cost estimate and enable the customer to assess the conceptual feasibility of the project.

Project: Ma'aden Phosphate Development
Customer: Saudi Arabian Mining Company
Phases: IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Saudi Arabia

Saudi Arabian Mining Company has engaged WorleyParsons to provide engineering and PMC services for the Ma'aden Phosphate Project. The project involves the development of a phosphate mine at Al-Jalamid and the chemicals complex, town site and related infrastructure at Raz Az Zawr. The infrastructure also support Ma'aden's aluminium project and further industrial development in the new Minerals Industrial City at Raz Az Zawr. During construction, the direct workforce will total some eight thousand employees. When completed, the Ma'aden Phosphate Project will be the largest integrated fertilizer plant in the world, producing 3 Mtpa of diammonium phosphate which will represent 10% of global production.

Project: Pooncarrie Minerals Sands Project EPCM
Customer: BeMax
Phases: IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

Australia

The Bemax Pooncarrie Mineral Sands Project, a Greenfields mineral sands development in the Murray Basin of New South Wales, consisted of the development of the Ginkgo Mine Site which included: Construction pit/mining pond; Pond flooding water dam/tailings dam; Airstrip; 30km long 66kV ETL; 66/22 kV substation; Wet concentrator; Dredge relocation and refurbishment; HMC processing facilities' 64km haulage road; The simultaneous construction of a mineral separation plant located in Broken Hill; Train uploading the ship loading facilities in conjunction with material handling and storage capability at Port Adelaide; and the upgrade of existing mineral separation plant in Bunbury.

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EcoNomics™ Assessment

WorleyParsons provides customers with invaluable strategic decision making support by quantifying project sustainability during the critical *Select* phase.

EcoNomics™ enables our customers to properly consider the social, ecological, community and financial impacts of existing and planned facilities. The key to long-term profitability for projects is increasingly dependent on ensuring these issues are considered in the *Select* phase and embedded into the subsequent delivery phases of the project.

We work closely with our customers in framing workshops to agree on key project objectives, identify project options, and determine the financial and external assets to be assessed and risks to be evaluated. This early interaction with the widest possible range of stakeholders provides a clear focus for the assessment and assists in building relationships.

WorleyParsons has developed a suite of proprietary assessment tools with the ability to consider any combination of financial, environmental and social issues for project analysis on a range of possible future conditions and relate them to the customer in the single universal metric of money. Quantifying these different elements is made possible by using the latest available economic studies, literature and research, along with current market costs, to value externalities. All external values are taken from reputable organizations such as the UN, World Bank, and other government and industry bodies worldwide.

We use likely ranges of values for external assets which allow uncertainties to be harnessed, providing better decision making, risk mitigation and a more robust project outcome. Evaluating project options in this way assists our customers to optimize their environmental and social spending to avoid unnecessary expenditure driven by outside parties.

1
common metric for comparing all solutions - money

30+
external and internal variables to consider

100+
EcoNomics™ assessments completed on projects worldwide

Project: **Olympic Dam Expansion Prefeasibility Study of Ore Processing Plant**
Customer: **BHP Billiton - Olympic Dam Operations**
Phases: IDENTIFY > **EVALUATE** > DEFINE > EXECUTE > OPERATE

Australia

Greenhouse gas emissions assessment and mitigation options analysis

WorleyParsons has undertaken a site-wide greenhouse gas emissions assessment of the Olympic Dam Expansion project.

The assessment included a baseline study of emissions and an investigation of available greenhouse gas mitigation options, including a cost-benefit analysis to provide guidance as to the most effective and economic mitigation options.

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Our Vision

WorleyParsons will be the preferred global provider of technical, project and operational support services to our customers, using the distinctive WorleyParsons culture to create value for them and prosperity for our people.

Leadership

- Committed, empowered and rewarded people
- EcoNomics™ – Delivering profitable sustainability
- Integrity in all aspects of business
- Energy and excitement
- Minimum bureaucracy

Agility

- Smallest assignment to world-scale developments
- Local capability with global leverage
- Responsive to customer preferences
- Optimum solutions customized to needs

Relationships

- Rapport with all stakeholders
- Open and respectful
- Collaborative approach to business

Performance

- Zero harm
- Results for our customers and other stakeholders
- World-class resources, capability and experience

EcoNomics™

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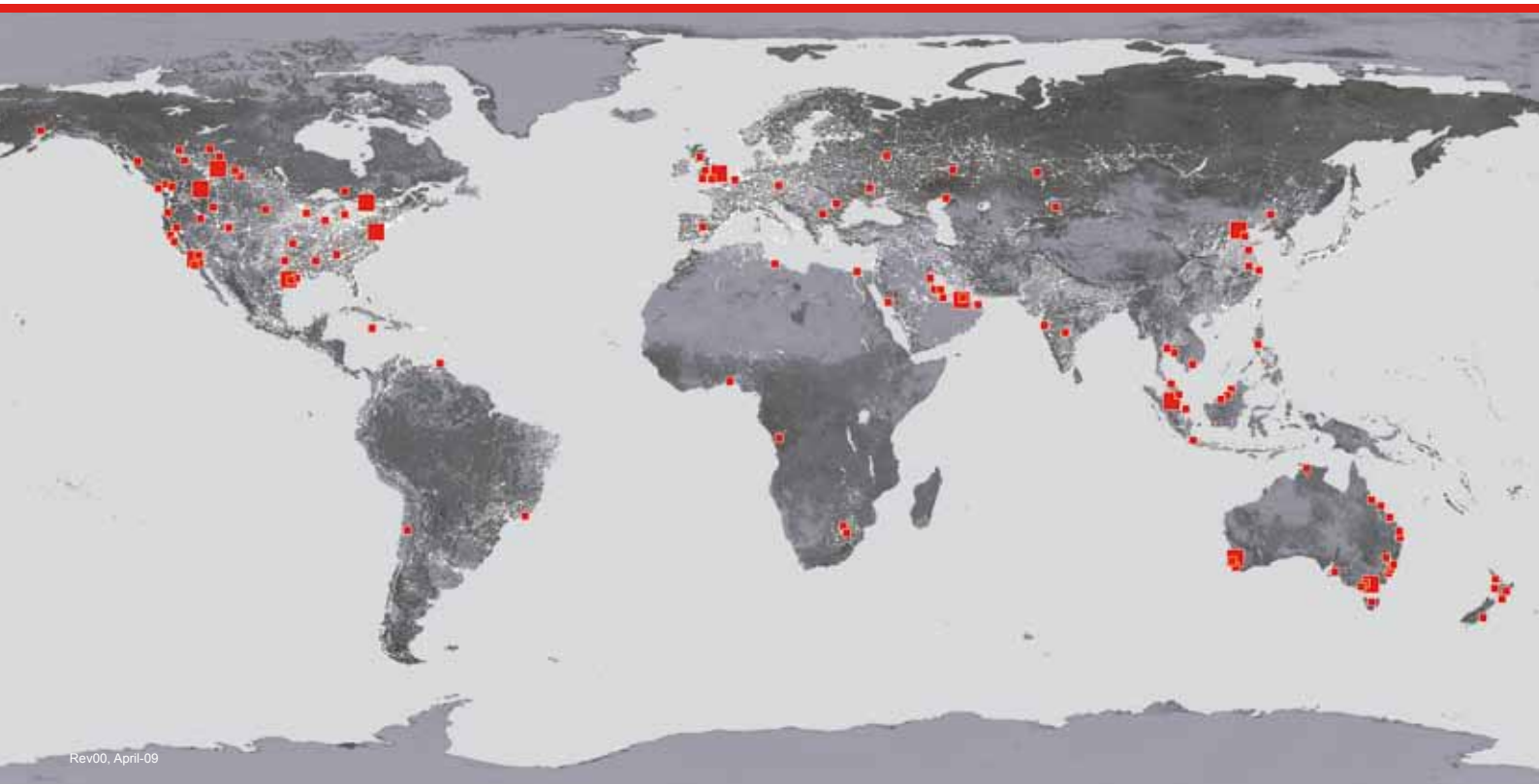
For further information about our global capability email:
select@worleyparsons.com

www.worleyparsons.com



Rev00, April-09