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Good environmental practice

Keeping marinas clean and green

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Eco-efficiency for the Marine Industry Fact Sheet



Within a marina, there are many activities that could have significant environmental impacts (see table 1). These issues need to be managed carefully and correctly to ensure that the people who use the water, the customers, continue to have an unpolluted environment.

Some marina operators see good environmental practice as a way of attracting new customers and keeping old ones. Many environmental initiatives also lead to efficiency improvements and financial savings.

This guide was developed as a quick reference for marina operators wishing to manage environmental issues

responsibly, and is a summary of other, more detailed resources designed to assist marina operators in doing what's best for the environment when managing their operations. To find out more about the practices introduced in this fact sheet, you should consult the other fact sheets in this series that deal with the following issues:

- fact sheets and self-assessment checklists to assist facilities in reducing energy and water consumption and waste production
- fact sheets outlining best practice in abrasive blasting, surface preparation, spray painting, welding and fibre composite manufacture
- fact sheets outlining strategies that facilities can implement to improve eco-efficiency, including environmental management systems, lean manufacturing and digital manufacturing
- a fact sheet summarising the environmental legislative requirements facing the marine industry.

Table 1: Environmental impacts of the marine industry

| Environmental issue | Potential sources |
|-----------------------------|---|
| Air quality | Solvents such as styrene, toluene, tetrachloroethylene, trichloroethylene and dichloromethane from resins, paints, glues, degreasers, sealants, cleaners and strippers. Dust from sanding, grinding and cutting |
| Solid waste | Fibreglass, wood, packaging, metal (aluminium and steel), sawdust, resin, buckets, drums, household waste |
| Hazardous chemicals | Solvents such as styrene, toluene, tetrachloroethylene, trichloroethylene and dichloromethane from resins, paints, glues, degreasers, sealants, cleaners and strippers |
| Trade waste/water pollution | Paints, acetone, solvents, thinners, oils, MEK, resins, gun wash and cleaning/antifouling waste |
| Ground contamination | Cleaning and antifouling residue, oils, fuels, paints, etc. |
| Energy use | Machinery, tools, compressors, heating, welding, vacuum, water heating, computers |
| Water use | Cleaning, testing |
| Noise | Compressors, cutting equipment, vehicles |

Other resources

- Clean Marinas-Australia is an accreditation system that provides recognition and marketing support for Australian marinas that adopt good environmental practice. The program is a national, voluntary accreditation system for marinas, yacht clubs, boat clubs, slips, boatyards and associated industry operators across Australia, and has been developed to support Australia's marine industries in their endeavours to protect our coastal and inland waterways. The organisation provides ongoing advice for marina operators, and supplies a handbook that specifies good practice for all aspects of environmental management at marinas. The issues of staff training and education of boat enthusiasts are also addressed. As the operator of an accredited Clean Marina, companies benefit from the use of Clean Marinas-Australia logos, flags and materials. Businesses also receive the benefit of centralised Clean Marinas-Australia's marketing programs, which promote Clean Marinas throughout the boating community. More information can be found at www.marinas.net.au
- Gold Coast City Council's *Guide to Completing your Environmental Management Program for Marina Operators and Boat Maintenance and Repairers* ^[1]
- The Brisbane City Council *Pollution Standards for Boat Maintainers/Repairers and Marina Operators* ^[2]
- Brisbane City Council's *Pollution Solutions – Marina Operators & Boat Maintainers and Repairers*^[3]
- Brisbane City Council's *Pollution Solutions – Metal Finishers and Engineers*^[4]
- Brisbane City Council's *Pollution Solutions – Abrasive Blasters*^[5]

'Good environmental practice has always been a priority for us – we're in this business because we love being on the water and our customers love being on the water. Initiatives like the Clean Marinas-Australia program help to ensure that our seas and waterways remain as clean as possible for future generations to enjoy. We hope that other marinas will take our lead and embark upon this voluntary accreditation process.'

Adam Jackson, then Director of Pier 35 Marina Village.^[6]

The accompanying guide provides examples of good practice in many of the typical activities occurring at marinas, including:

| | |
|---|-------------------------------|
| spray painting, surface preparation and abrasive blasting | liquid storage and refuelling |
| stormwater and wastewater management | maintenance and housekeeping |
| solid waste management and recycling | fibre composite manufacture. |
| general site management | |

Case Study: Environmental management system brings benefits to East Coast



East Coast Marina had always considered the systematic management of environmental issues in the marine environment as important, so when they found out about the Clean Marinas program, it seemed natural to gain recognition for things that they were largely already doing. *'You have to have some sort of direction when it comes to environmental issues, otherwise you can't manage them properly. That's why an environmental management plan is so important,' says Steve Newbury, Assistant Manager at East Coast Marina.*

Under the Clean Marinas program, accredited marinas fly a prominent blue flag at the marina that shows that they have made a public commitment to improve, and that they manage their environmental issues well. Marinas have a right to use the logo in their own marketing, and are also promoted by the Marina Association of Australia (www.marinas.net.au) through its marketing efforts. To ensure that standards are upheld, every marina must undergo an independent assessment every year by an accredited consultant.

East Coast already had a documented environmental management plan in place, which made certification relatively straightforward. Having a water collection, filtration and recycling system in place also helped. Some changes had to be made to the way recyclable material was handled, but with the benefits of good environmental management and the recognition that Clean Marinas brings, East Coast Marina believes it was worth it.

'It costs just as much to do it wrong as it does to do it right, and this way, the environment benefits.'
– Steve Newbury, Assistant Manager, East Coast Marina.

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Call 1300 369 388 for further information.

Good practice quick reference guide for marinas

Abrasive blasting, surface preparation and spray painting

Abrasive blasting

- Consider alternatives to abrasive blasting, such as dustless sanding
- Prohibit uncontained blasting
- Remove anodes before commencement
- Perform blasting within ventilated spray booths or enclosures away from the water
- If blasting within textile or plastic enclosures, avoid blasting during windy days
- Investigate recycling of blast media
- Store spent blast media under cover

Paint stripping and hull preparation

- Consider alternatives such as scraping, sanding, or abrasive blasting
- Use a heat gun to remove paint and varnish where appropriate
- If paint strippers must be used, use soy-based or water-based products, which are less hazardous
- Measure amounts carefully and use only the minimum required
- Prevent evaporation by using tight fitting lids, stoppers or automatic lids
- To prevent spillage, reduce distances between storage areas and use areas (e.g. store paint in the workshop)
- Place the product on an impervious base
- Inform all employees of the hazardous nature of solvents, and their purchasing and recycling costs
- Conduct compounding and waxing away from the water
- If possible, use phosphate free, biodegradable and non-toxic soap when preparing a hull
- When removing tough stains, use only as much stain remover as is necessary, or use a more abrasive rubbing or polishing compound

Antifouling

- Change to and recommend long-lasting, low-toxicity antifouling paint
- Stay informed about newer, less toxic antifouling products such as teflon, silicone, polyurethane and wax that are suitable in some applications (e.g. high-use vessels)
- Follow manufacturer's specifications for application and reapplication
- Discourage use of antifouling paint on boats kept and used solely in freshwater
- Recommend that boats that are rack/stack stored or trailered use alternatives to antifouling paint
- Use dust-collecting sanders when sanding antifouling paint
- Avoid abrasive blasting of antifouling paint
- Sweep and collect paint chips and biofouling debris immediately after scraping or sanding, rather than hosing
- Mix paints and solvents away from the water, and prevent drips
- Avoid mixing paint or cleaning brushes on open pontoons or other structures over the water
- Use drip trays and weighted tarpaulins and sheeting to contain droppings and spilled materials
- Mix precisely enough material necessary for the job
- Save excess or unused antifouling paint for future uses
- Re-use solvents and thinners by draining the clean product off the top once solids settle out
- Prohibit in-water hull cleaning, hull scraping, or any process that occurs in-water or underwater that could remove antifouling paint or biofouling (including marine pests) from the boat hull



Examples of suitable enclosures for spray painting and abrasive blasting in the open

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Scraping and sanding

- Conduct sanding and scraping away from the water's edge
- Remove anodes before commencing
- Conduct in a closed ventilated space or use a temporary structure with plastic or textile sheeting to minimise the spread of windblown dust
- Place drop cloths or tarpaulins under vessels when sanding or scraping. Weight the edges of tarpaulins and drop cloths to keep them in place
- Consider installing an impervious pad for conducting debris-producing maintenance
- Clean up debris, garbage, sanding dust, biofouling and paint chips immediately following scraping or sanding
- Biological material removed from boat hulls should be adequately contained and disposed of either to a licensed landfill site or an on-site waste treatment plant
- When sanding or grinding hulls over a paved surface, vacuuming or sweeping loose paint particles is preferred. Do not hose the debris away
- If outside, avoid scraping or sanding on windy days
- Use dustless/vacuum sanders and require customers and contractors to do the same
- Provide a collection drum for the dust from vacuum sanders and other scraping debris
- Restrict or prohibit sanding and scraping boats that are in the water
- If sanding, scraping or grinding must take place while the boat is in the water, use tarpaulins and sheeting installed between the vessel being worked on and the pontoons or walking surface to prevent dust, paint chips, debris, or other materials (including fouling organisms) from falling or being blown into the water. The sheeting should have a tight seal to the vessel and adjacent surfaces to prevent leakage of particles outside the work area. Remove the sheeting carefully to prevent the loss of accumulated waste material into the water

Painting

- Spray items inside a purpose-built booth or similar structure with ventilation and filtration systems, away from the water
- Return all unused paints to a centralised storage area and immediately and properly manage empty containers
- Mix only as much paint as needed for a given job
- Consider sharing leftover paints with customers or setting up an exchange area to swap unused items

- If painting in the water must be done, limit in-water painting to areas where paint materials and spills can be contained and prevented from entering the water. Transfer the paint in a small, tightly covered container to minimise spills. Install tarpaulins and sheeting with a tight seal between the vessel being worked on and the pontoons or walkway surface. Remove the protective sheeting with care
- Do as much work as possible away from the water, including mixing paints and cleaning brushes
- Use weighted tarpaulins or drop cloths to collect drips
- Use drip trays for all paint mixing, paint transfer, and equipment clean up
- Use water-based paints and surface preparations with low volatile organic compound (VOC), high solids content, instead of traditional paints and primers
- Encourage the use of non-toxic, high-bonding and easily cleaned hull coatings
- Use more efficient painting equipment, such as rollers, or efficient spray painting technologies such as high volume low pressure paint guns (see Fact Sheet 6 on spray painting and Fact Sheet 16 on abrasive blasting)
- Contain and clean up spills immediately
- Avoid working on windy days
- Limit the amount of leftover paint and decrease solvent use by using a smaller paint spray gun cap
- Re-use solvents and thinners by draining the clean product off the top once solids settle out

Teak refinishing and varnishing

- Avoid teak cleaners or varnishes containing acids (e.g. phosphoric acid, oxalic acid) or those labelled caustic, corrosive, or acidic
- Clean teak with a mild, phosphate-free detergent with bronze wool, if possible
- If sanding teak, use a dustless or vacuum sander
- Conduct teak refinishing away from the water's edge. If not possible, use safer cleaners and avoid flushing teak cleaner and teak oil into the marina basin
- Mix only as much as needed for a given job
- In case of spills of varnish on land, use absorbent material to clean it up, and collect any contaminated soils. Spills into water must be contained and mopped up with booms or pads that repel water and absorb petroleum products.

Stormwater and wastewater management

Cleaning and washing

- Stormwater from clean areas of the site should be separated by physical means such as catch drains, diversion drains or bunds from those areas that can become contaminated
- Wherever possible, dry cleaning methods such as sweeping and vacuuming should be chosen in preference to wet cleaning methods. Regular dry cleaning can prevent the need for wet cleaning
- Wipe with a rag before cleaning to avoid unnecessary contamination of stormwater or wastewater
- Install trigger hoses to prevent unnecessary run-off
- All maintenance and repair should occur on a dedicated area with an impervious surface (e.g. concrete)
- Install a permanent catch drain, above high tide water level around areas where contaminants may originate (e.g. hardstand areas), that collects residues and directs any waste liquids and solids to a collection pit via a silt trap. The silt trap removes any coarse sediment from the wastewater before pretreatment and disposal. The collection pit should be large enough to hold the first flush (i.e. the first 10 mm of rainfall over the catchment area) of wastewater, or the expected volume of wastewater from wet cleaning processes, whichever is greater. The wastewater can be retained on site in the collection pit and subsequently disposed of in an approved manner
- Wastewater should be disposed of by waste contractors who clean out the silt trap and collection pit upon request, by disposal to the sewer under a trade waste agreement with council (pretreatment may be required), or by treatment of wastewater on site using a water quality treatment device (e.g. holding tanks, sediment traps, filters, oil/water separators, pH dosing) that can remove and treat pollutants of concern
- Add filters to storm drains that are located near work areas to screen solid materials out of run-off
- Place absorbent materials in drain inlets to capture oil and grease
- Place waste bins away from stormwater drains
- Remove anodes prior to blasting
- Contain spray painting, blasting, scraping and sanding residues properly by using dedicated facilities and containment measures such as protective sheeting, drop sheets and drip trays
- In-water work should only be carried out where removal of the boat is impractical, and is only permitted with proper encapsulation, filtering of air and water and collection of residues
- Clean up fluid spills quickly with absorbent material
- Where buildings or enclosed areas are not available,

provide clearly designated land areas as far from the water's edge as possible for debris producing maintenance

- Store all pollutants such as paints, coatings, pesticides, used oil containers, detergents, etc. under cover
- If you must use fertiliser, apply it in autumn and spring
- Plant a vegetated filter strip or buffer between impervious areas and the marina basin
- Maintain catch basins regularly, including garbage removal and removal of sediment. At a minimum, catch basins should be cleaned at the beginning and end of each boating season
- Avoid or minimise the use of ammonia, petroleum or chlorinated solvent-based cleaning agents
- Cover floor drains if there is a spill. There are inexpensive covers available for this purpose
- Distribute your good practice guidelines to subcontractors and tenants and include them in contract requirements



Sweeping roads prevents water pollution



Clearly marked drains indicate which materials may enter

Boat wastewater

- Provide reasonably priced or free pumpout, shower and toilet facilities
- Require or recommend the use of oil absorption pads in bilges to absorb small drips and spills
- Do not allow dumping of oil from boats
- Regularly maintain boat engines to prevent leaks
- Implement practices and guards to prevent spillage of fuel—no overfilling
- Use clearly marked recycling or disposal receptacles for waste oil, cooling liquid additive
- No caustic boat cleaning
- Discharge bilge water to an onshore holding tank or sewer



A hull set up for infusion moulding

Fibre composite manufacture

- Conduct all laying up of moulds in a booth, shed or building. Keep the doors closed when undertaking this work and ventilate mechanically
- Use techniques (e.g. correct spray pressure, flow rate, spray pattern, spray distance) that minimise emissions to air and resin use (see Fact Sheet 13 on fibre composite manufacture)
- Use technologies (e.g. hand lay-up, closed moulding, infusion moulding) that minimise emissions to air and resin use (see Fact Sheets 13 & 14 on fibre composite manufacture)
- Use appropriate personal protective equipment to protect employees against dust and fumes
- Have appropriate ventilation for work areas

- Before pumping out a bilge, visually inspect the bilge water to determine whether there is oil on the surface. Use oil absorbent materials or an oil/water separator to remove oil before pumping a bilge
- Do not use soaps and detergents to clean up oily bilge water
- Hardstand waste holding tanks, if above ground, should be secured and have a secondary containment area, including a concrete pad
- To encourage use, inspect public areas regularly to ensure that they are well-maintained and clean
- Erect signs in the marina outlining the rules for proper sewerage handling
- Provide and promote biodegradable and non-toxic holding tank deodorant



A vacuum bagged part

- Apply filtration to ventilation air to reduce VOC emissions and odour
- Keep tight lids on all containers containing solvents or resins
- Decant liquids into smaller containers with lids
- Place paintbrushes, rollers, scissors, knives, and gun parts in containers with lids for soaking and cleaning
- Trial low styrene resins, low-VOC solvents and non-toxic alternatives
- Use a purpose-built cleaning system
- Minimise waste by working with small batches of resin
- Use good housekeeping to minimise waste (see Fact Sheet 8 on solid waste management)

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Maintenance and Housekeeping

Spills

- Identify and stock relevant safety equipment such as personal protective equipment and spill kits
- Inform all staff of spill procedures
- Turn off the source, plug the leak or upright the container
- Confine the spill with sandbags, booms or other suitable material
- Block access to stormwater grates with drain covers, shut-off valves etc.
- Notify the relevant supervisors and inform relevant agencies if needed
- Neutralise hazardous substances and pump or sweep into a safe container. Do not allow any residues to escape into the stormwater grates or soil
- Have waste removed by a licensed waste contractor
- Immediately replace all cleanup material
- Assess the cause of the spill and take action to prevent recurrence

Commissioning/decommissioning engines

- Inspect fuel lines for leaks or potential leaks such as cracks and loose connections. These can be persistent problems that last throughout the season, leaking engine fluids into the bilge
- Local companies or authorities may accept unwanted petrol and petrol products and fuel/oil blends generated by individual boat owners
- Use propylene glycol radiator fluids/coolants (much less toxic) except in 'closed or freshwater' cooling systems.
- Use the minimum volume of radiator fluids/coolants necessary
- Where appropriate, add stabilisers to fuel to protect engines against corrosion and the formation of sludge etc. Stabilisers are available for petrol/petrol products including diesel fuels and gearbox oil
- Check manufacturer's warranty on engines before adding fuel stabilisers
- Fill fuel tanks to 85% to 90% full to prevent flammable fumes from accumulating and to minimise the possibility of condensation leading to corrosion
- Do not fill the tank more than 90% full if the boat has an external overflow vent. The fuel will expand as it warms and fuel will spill out the vent line of a full inboard tank

Degreasing and parts washing

- Use water-based, non-VOC cleaners that are less hazardous than solvent-based degreasers. They are also less toxic and non-flammable

- Do not use a toxic or flammable organic solvent if you don't have to
- If using VOC-based solvents is unavoidable, catch excess solvents in a drip tray and re-use
- Do not mix or add other types of solvents to any degreaser
- Never discard any degreasing solvent into sinks, floor drains or onto the ground. It will ultimately find its way to local waters, and as little as a spoonful may render tens of thousands of litres of water uninhabitable for aquatic life or unfit for human consumption
- Keep lids on solvent containers. Use automatic lids where appropriate

Oil changes

- Carefully collect and store used oil before removal for disposal. Instruct all employees who handle used oil on the proper operation and management of the oil storage area
- Remind boaties not to mix used oil with radiator fluids/coolants or hazardous waste, such as waste petrol and petrol products
- Provide a clearly marked area for the collection of used oil
- Use kitty litter, sawdust or other commercially available products to absorb oil from minor spills
- Purchase a non-spill vacuum-type system for spill-proof engine oil changes, or to suction oily water from bilges
- Slip a plastic bag over used oil filters prior to removal to prevent drips
- Recycle used oil filters. Puncture and drain them first. Collect and manage the contained waste oil
- Use oil absorbent materials to clean up small drips and spills
- Sell oil absorbent pads in the chandlery
- Educate customers and staff not to use soaps and detergents to clean up oily drips and spills
- Avoid pumping bilge water that is oily or has a visible sheen
- Use oil absorbent materials or an oil/water separator to remove oil from wastewater/stormwater before pumping
- Use a portable or stationary oil/water separator to clean bilge water. These devices draw contaminated water from bilges, capture hydrocarbons in a filter and discharge clean water
- Do not allow the dumping of used oil overboard, onto the ground, into sewers or stormwater drains
- Never mix petrol and petrol products, radiator fluids/coolants, or chlorinated solvents into used oil because it may cause the used oil to become a hazardous waste, therefore requiring higher disposal costs

Rags

- Keep oily rags separate from rags that have been contaminated with hazardous materials such as solvents
- Contract a licensed industrial laundry service that will pick up soiled rags and deliver clean rags on a regular basis
- Store flammable rags in approved, labelled containers until they can be laundered
- Reduce the amount of solvent used in cleaning through improved work practices
- Use solvents only when absolutely necessary
- Use non-VOC cleaners
- Remove excess solvent from rags by wringing or pressing excess into coverable container

Magnesium anode replacement

- Remove anodes prior to abrasive blasting and pressure washing tasks
- Scrap metal dealers will take used zinc and magnesium anodes for recycling
- Store zinc and magnesium anodes with other recyclable scrap metals in clearly marked containers protected from the elements

Cleaning

- Prohibit hull cleaning or hull scraping or any process that occurs in-water or underwater and removes antifouling paint or fouling organisms from the boat hull
- Contain and treat all wastewater from pressure washing to prevent the return of biofouling, including marine pests, to the marine environment
- Remove anodes before beginning pressure washing
- Collect all washdown water, treat it, and discharge to the sewer or store for transfer to a sewerage treatment plant
- Minimise the amount of water used when boats are pressure washed (e.g. reduce pressure, wash the hull above the waterline by hand)
- If collecting and treating washdown water is not feasible, wash boats on a level permeable surface (e.g. lawn, crushed stone, or sand) so that the washdown water can infiltrate into the ground
- Place filter fabric over the ground surface to collect solids and sediments
- To ensure that the washdown water has enough time to settle into the ground, pressure wash boats as far away as possible from the water, preferably over a grassed or vegetated area. Add a row of hay bales between the water's edge and the pressure washing operation

- If it is not possible to wash boats over a permeable surface, pump the washdown water to a pervious surface for filtration
- Treat the washdown water to collect solids and sediments before discharge, preferably to the sewer
- If the wastewater does not contain chemical additives, it may be diverted into wetland detention basins, vegetated buffers, or swabbing
- Where feasible, wastewater from the washing operation can be collected and re-used through a collection system, or can be used after treatment to irrigate landscaped portions of the marina
- Try to use cleaning products containing lower concentrations of VOCs, ozone depleting chemicals or carcinogens
- Always try cleaning with water and a coarse cloth first. Clean more often with fresh water only
- If you must use a cleaner, use the product sparingly
- Contact your supplier to see if there are less toxic alternatives for your cleaning products
- Some non-toxic alternatives to typical cleaning products are:
 - all purpose cleaner: mix one cup of white vinegar with ten litres of water
 - air freshener: an open box of baking soda
 - ammonia-based cleaners: vinegar, salt, and water
 - brass cleaner: Worcestershire sauce or paste made with equal amounts of salt, vinegar, and water
 - copper cleaner: lemon juice and water or paste of lemon juice, salt, and flour
 - chlorine bleach: baking soda and water or borax
 - chrome cleaner/polish: apple cider vinegar to clean; baby oil to polish
 - disinfectant: one half cup of borax in five litres of water
 - drain opener: disassemble and use a plumber's pipe cleaner/snake or flush with boiling water mixed with one-quarter cup baking soda and one quarter cup vinegar
 - fibreglass stain remover: baking soda paste
 - floor cleaner: one cup of vinegar in ten litres of water
 - stainless steel cleaner: baking soda or mineral oil for polishing, vinegar to remove spots
 - toilet bowl cleaner: use toilet brush and baking soda
 - wood polish: olive or almond oil (interior walls only)
 - window cleaner: mix two tablespoons vinegar in two litres of water or rub glass with newspaper

Boat recovery and disposal

- Contain the area with floating booms and tarpaulins etc.
- Empty the boat's fuel tanks and re-use or dispose of used petrol and petrol products as hazardous waste
- Remove and recycle the used oil and oil filter, used radiator fluids/coolants, the boat engine (as scrap metal) and any other metal such as lead, zinc, aluminium and magnesium
- Remove all mercury-containing devices (e.g. some electronic equipment, bilge pumps, old ship barometers) and handle as hazardous waste
- Contact the relevant government authority to advise them of the situation
- Do not dismantle the vessel while it is in the water
- Remove the vessel onto a hardstand area or slipway, taking care not to dislodge fouling organisms. If fouling is dislodged, every attempt should be made to retrieve it
- If the vessel is to be disposed of, reduce the size of the hull into smaller pieces (out of the water and outside the catchment area) and dispose of appropriately
- If the vessel is sold, ensure that the owner slips, cleans and antifouls the vessel properly prior to sale

Compressor and vacuum equipment servicing

- Evaluate the need for installing a dehumidifying system in the air compressor/vacuum system that would reduce the moisture content of the compressed air and therefore the volume of wastewater generated. This may also prolong the life of your equipment by reducing loss of lubrication and reducing rusting

- Visually inspect the exterior of equipment for the presence of oil leaks on a regular basis
- Establish a preventative maintenance program that includes a schedule for cleaning parts, replacing oil and replacing filters as recommended in the manufacturer's specifications
- Remove any oil prior to discharge
- Investigate purchase of oil-free air compressors/ vacuum equipment to eliminate oils in wastewater

Landscaping

- Use native plants for landscaping to save water, fertiliser and pesticides
- Save water by watering in the early morning or late afternoon
- Consider drip irrigation and mulch covering for open areas. Oscillating sprinklers can lose up to 50% of water to evaporation on hot days
- Use composted fish waste as fertiliser for your plants
- Plant a vegetated filter strip or buffer between impervious areas and the marina basin to help intercept run-off
- If you must fertilise, do so in autumn and spring and use only the minimum required. Excess nutrients will cause run-off and damage the marine ecosystem (e.g. excess algal growth, reduced oxygen availability)
- Leave grass clippings on lawn areas for moisture and nutrient retention



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Solid waste management and recycling

Recycling

- Have clearly marked designated areas for recyclable waste including metal, wood, cardboard, paper, glass, batteries, hard plastic and oil. Recycling of electrical equipment and mobile phones is also possible
- Take and supply products in re-usable, returnable or recyclable containers
- Keep inventory at a minimum
- Design products to reduce off-cuts
- Contact suppliers to see if they take back unused or used chemicals, especially acetone
- Take back containers, pallets, cardboard or other packaging for re-use
- Use and encourage customers to use re-usable or recyclable boat covers
- Recycle used plastics and shrink-wrap. Some companies will collect them
- Encourage boaties to exchange excess paints, thinners, and varnishes rather than to rely on personal disposal
- Provide a noticeboard where boaties can indicate if they have or need a particular substance, or establish a paint and maintenance chemical swap area for customers
- Consider cooperating with other nearby businesses to simplify recycling and reduce costs

Mixed waste

- Place covered garbage receptacles in convenient locations away from the water for use by marina patrons
- Do not put garbage or recycling containers on docks, as waste can easily blow into the water
- If practical, lock garbage receptacles at night to prevent 'midnight dumping'
- Train employees to pick up stray garbage
- Purchase products made with recycled contents
- Buy recycled printing and writing paper, towels, tissue, re-refined motor oil and radiator fluids/coolants

Hazardous waste

- Have documented and easily accessible procedures for hazardous waste, that are distributed to employees, tenants and contractors
- Keep good records of hazardous waste use and disposal. Use only licensed contractors for hazardous waste

- Implement regular collections of hazardous waste to avoid build-up
- Store used acid batteries on an impervious surface, such as sealed or painted concrete to protect the surface from degradation, and inspect used acid batteries regularly for leaks and deterioration. Segregate batteries from other wastes
- Avoid long-term storage of acid batteries
- Store used acid batteries upright in a secure location, protected from the elements, and do not stack batteries directly on top of each other. Layer with wood
- Never drain batteries or crack the casings
- Place cracked or leaking batteries in a sturdy, acid-resistant, leak-proof, sealed container. The container should be kept closed within the battery storage area
- Strap batteries to pallets or wrap batteries and pallet in plastic during transport

Fish waste

- Prohibit disposal of fish waste in the marina basin and inform patrons of the rules
- Install a fish cleaning station at your marina
- Clearly identify the fish cleaning stations with signs that list the rules for their use
- Direct rinse-water from fish cleaning areas to a sand filter or sewer
- Compost fish waste if possible
- Encourage boaties to freeze fish parts and re-use them as bait or berley on the next fishing trip
- Use a grinder to make berley out of fish carcasses. Freeze and sell berley at the chandlery
- If composting or freezing is not possible, encourage boaties to double-bag fish parts and discard in their garbage
- Encourage boaties to clean fish offshore where the fish are caught and discard of the fish waste in unrestricted waters

Pet waste

- Require patrons to clean up after their pets
- Provide bags for boaties to scoop up waste and dispose of in their garbage
- Specify pet waste rules in marina-customer contracts
- Encourage cat owners to maintain a litter box on their boat
- Liquid storage and refuelling

Liquid Storage and Refuelling

Liquid storage

- Ensure that containment is adequate to prevent pollution in case of a spill
- Storage should be in accordance with Australian Standards AS 1940 –*The storage and handling of flammable and combustible liquids* and AS 1692 –*Tanks for flammable and combustible liquids* (e.g. local bunding or storage areas should be impervious and hold 110% of maximum storage)
- Check bunded areas regularly for cracks or weaknesses that could lead to leaks in the case of a spill
- Store only compatible liquids. Check the product material safety data sheets (MSDSs) for further information
- Train staff on spill procedures
- Keep a spill kit in a well-marked, appropriate place (i.e. close to potential spills)
- Keep up-to-date copies of fuel records (e.g. licences, inventory, maintenance) and MSDSs in a well-marked, centralised location. Inform employees, contractors and tenants where MSDSs are kept

Refuelling

- Require patrons and staff to conduct all refuelling operations in a dedicated refuelling area, which is clearly marked and signposted
- Locate fuel docks in protected areas to reduce potential for accidents due to passing boat traffic, and design them so that spill containment equipment can be easily deployed to surround a spill and any boats that may be tied to the fuel dock
- Ensure that refuelling areas are protected and contained similarly to fuel storage areas (e.g. see AS 1940 and AS 1692)
- The surface of the refuelling area will need to be impervious to prevent leakage of any spillage to the soil
- Keep a spill kit in a well-marked, appropriate place nearby
- Carry vent line whistles, vent cups, oil absorbent fuel collars and other spill preventative devices in the chandlery
- Install vapour recovery devices on fuel tanks
- Seal ground underneath all fuel pumps
- Provide a stable platform for fuelling personal watercraft if your facility services significant numbers of them
- Regularly inspect and repair fuel transfer equipment such as hoses and pipes

- Place plastic or nonferrous drip trays lined with oil absorbent materials beneath fuel connections
- Train fuel dock staff to handle and dispense fuel properly
- Fuel dock staff should be trained to fill tanks slowly and carefully, and prevent overfilling of fuel tanks by listening to or keeping a hand at the air vent, if possible—a pronounced flow of air is emitted when the tank is nearly full
- Remember that fuel expands when it is warmed and to leave 5% of space in a fuel tank to allow for expansion
- Attach a container to the external vent fitting to collect overflow
- Keep an absorbent pad or pillow ready to catch spills, drips, or overflow
- Put a drip tray under portable fuel tanks
- If possible, fill portable fuel tanks ashore

Before fuelling

- Stop all engines
- Shut off all electricity, open flames (including pilot lights on gas appliances) and heat sources and check all bilges for fuel vapours
- Extinguish all smoking materials
- Close access fittings and openings that could allow fuel vapours to enter enclosed spaces

During and after refuelling

- Maintain nozzle contact with fill pipe
- Wipe up spills immediately
- Avoid overfilling
- Fuel filling nozzle must be attended at all times
- After refuelling, inspect bilges for leakage and fuel odours and ventilate until fumes and odours are removed

Fuel tank disposal

- Use or recycle usable fuels before disposing of the tank
- Store tanks awaiting disposal away from ignition sources like heat or sparks
- Clearly label waste tanks
- Never pour fuel down the drain, onto the ground, or into the garbage

General site management

Noise

- Do not allow noisy activities before 0700 and after 1800
- Install noise barriers around noisy equipment
- Use visual signals, portable telephones and digital pagers in preference to public address systems, hooters etc.
- Restrict heavy vehicle movement to working hours only
- Ensure there are effective exhaust mufflers on all machinery, vehicles and air-powered tools
- Maintain equipment regularly
- Mount mechanical equipment on mounts designed to reduce vibration and noise

Energy consumption

- See Fact Sheet 3 on lighting, Fact Sheet 7 on compressed air, and Fact Sheet 15 on motors
- Conduct an energy audit to determine which areas use significant amounts of electricity and to identify areas for improvement
- Compressors—keep air inlet cool, maintain compressors regularly, install variable speed-drive compressors, repair leaks, reduce air pressure, use blowers where possible, recover heat from outlet, turn off compressors at night
- Do not use oversized equipment
- Install energy-efficient lighting and use technology and practices to switch off lights when not needed
- Size airconditioning properly, and cool only when and where needed
- Reduce the need for airconditioning with good ventilation and insulation
- Do not use oversized water heating equipment, and keep hot water temperature to a minimum (around 60°C)

General site management

- Consider implementing an environmental management system (EMS) to help coordinate the management of environmental issues (see Fact Sheets 17 & 18 on environmental management systems)
- Assess potential hazards at your facility, both man-made (fuel spill or fire) and natural

- Develop a spill response plan, even if you are not required to by law. The plan should consider training, necessary equipment, procedures for containment and clean-up of all spilled chemicals on-site. Review the plan regularly. See 'spill procedures' above
- Distribute information on good environmental practice to your tenants, patrons and employees
- Provide clear signage on required practices
- Train employees in good environmental practice
- Include good environmental practice in customer contracts
- Provide a list of 'rules' to your customers who do their own boat maintenance

References

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Note – this fact sheet does not constitute legal advice.

For further information

Ecobiz can assist you to reduce costs and improve eco-efficiency in your business Call 1300 369 388 for further information.

Eco-efficiency Project Officer
Marine Industries and Fibre Composites Group
Department of Tourism, Regional Development and Industry
Telephone: 07 3227 5756
marine@dtrdi.qld.gov.au
www.marine.industry.qld.gov.au