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Application to the Environment Agency

for a

Permit to Operate

a

Part A (1) Installation

by

South West Metal Finishing Ltd

at

Yeovil, Somerset

**Application Reference EA/PPC/AP3334SV
Cadmium Plating Facility - Yeovil**

April 2005

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DRN	Section	Title	Date
SWMFL/100	F4	Non-Technical Summary	3.04.05

South West Metal Finishing Ltd (SWMFL) is a subsidiary company of the EIC Group whose office is based in Exeter. SWMFL, also based in Exeter, is a sub-contract surface treatment shop specialising in treatments for the aerospace and defence industries. SWMFL has a division in Yeovil where zinc plating is carried out (the process volume of the plant as defined in the EA Guidance IPPC S2.07 is less than the 30 m³ threshold). The company proposes to install a cadmium plating facility at the Yeovil site (the subject of this Application) that will be principally dedicated to work from Westland Transmissions Ltd (WTL).

The proposed installation comprises the following:

Input raw materials storage
 Goods inwards
 Aqueous cleaning, masking and de-masking area
 Grit blasting
 Cadmium plating line including wastewater reduction unit
 Goods inspection
 Goods out
 Waste water storage
 Solid waste storage

The process design conforms to third generation plating technology pioneered by Marquis Associates at several cadmium plating facilities in the UK. The process has a materials efficiency of 99% achieved through multistage cascade inter-process rinsing and a total return of drag-out to the plating station. All the other rinsing stations also utilise multistage cascade rinsing so that water consumption is less than 1 m³/24 h day. Chromium and cadmium containing wastewater from the passivate and the cadmium stripping process is volumetrically reduced by evaporation in a wastewater reduction unit. There is no discharge of water to sewer, controlled waters or land. A licensed waste disposal contractor removes concentrated liquor from the wastewater reduction unit from time to time.

The aerospace and defence industry manufacturers demand a high standard of treatment and the SWMFL management and operating personnel, with the company's accreditation for the ISO 14001 EMS Standard at its main Exeter site, are formally trained, not only in maintaining client product specifications, but also in ensuring that all health safety and environmental regulations are met.

DRN	Section	Title	Date
SWMFL/101	A1.5	Justification for the Classification of the Installation as one of Low Impact	3.04.05

Section 3 of the Environment Agency IPC Reg Series No.7 sets out the principles by which the installation will be judged to be Low Impact:

3.1 a) Management techniques:

All of the criteria described below must be met without having to rely on significant management effort. In other words, the installation intrinsically must have only a low environmental impact.

Applicant's response:

Electroplating operations are given a Complexity attribute of 'A' under the EP-OPRA Assessment – the least complex. The emission of waste from the installation is below the EP-OPRA emission threshold, thus giving an Emission Attribute index of 0. There will be no emissions to land or water. The base plating technology is mature and well established over several decades. Unlike most cadmium plating facilities, the installation is specifically designed for its purpose and incorporates the most modern recycle technologies to obtain a cadmium materials efficiency in excess of 99%.

3.1 b) Raw materials: the installation must not release more than 20 m³ of water per day as waste water or effluent. No account need be taken of the volume of water exported from the installation as product.

Applicant's response:

The maximum consumption of water is 1 m³ / 24 h day. There is no release of wastewater or aqueous effluent to the sewer or land.

3.2 c) Techniques to prevent and reduce waste arisings and emissions: The installation must comply with the criteria in this Guidance without having to rely on active abatement. In particular, releases must not be dependent on continuing or correct operation of equipment. If the installation depends, for example, on active abatement in the form of scrubbers, filters or electrostatic precipitators to achieve the releases set out in this Guidance, it is unlikely that it can be treated as having only a low potential for impact as failure of these could clearly result in significant increases. This is wholly consistent with the test applied earlier under IPC.

Applicant's response:

The installation has no active abatement equipment.

3.1 d) Groundwater Regulations: there must be no planned release into the ground.

Applicant's response:

There is no planned release of water into the ground.

3.1 e) Waste production: the installation must not give rise to more than 1 tonne of controlled waste per day, averaged over a year, with not more than 20 tonnes being released in any one day. No more than 1% should be special waste.

Applicant's response:

The expected discharge of hazardous waste will not be more than 6 kg / day. The discharge of inert waste (mainly packing materials and jiggling wire) will not be more than 2 kg / day.

3.1 f) Energy consumption: the installation must not consume energy at a rate greater than either 1MW or, if the installation uses a combined heat and power installation to supply any internal process heat, 10 MW, or 3 MW if fuelled by waste oil.

Applicant's response:

The energy consumption is 0.03 MW per 10 h day.

3.1 g) Accident prevention: the inventory of any substance at any time is not more than 5% of that of the COMAH Directive (lower tier) as set out in the Control of Major Accident Hazards Regulations 1999, Schedule 1.

Applicant's response:

The inventory of substances is in excess of 5%, but under 10% of the threshold (lower tier) set by the COMAH Regulations (50 t for toxic substances and 5 t for very toxic substances). It is understood that the Guidance has been revised, setting a value of 10%, and that a draft Consultation Document is to be issued in May 2005.

Specifically, the installation quantities are:

The mass of cadmium cyanide electrolyte in the plating station and associated storage is

: 4.15 t (draft toxic threshold 5 t)

The mass of sodium dichromate solution in the passivate station and associated storage is

: 0.49 t (draft very toxic threshold 0.5 t)

3.1 h) noise: as judged by the criterion set out in BS4142 the installation must be unlikely to give rise to any complaint of a discernable increase in noise. This implies that in any case the rating level should not be more than 5 dB (A) below the residual noise at any point on the boundary of the installation, whenever the installation is operating. This level may have to be reduced when:

background noise levels as defined in BS4142 are below 30 dB: or the spectrum of noise from the installation contains discernable tones or impulses. In coming to a view on this it is in order to ignore the operation of audible alarms sounding in an emergency.

Applicant's response:

Generally, the Environment Agency has taken the view that electroplating plants are not significant emitters of noise. In any case, there are no noise emitters within the installation other than small electric motors of less than 5 kW.

3.1 i) Emissions of polluting substances: there must be no likelihood of a release of a particular substance from the whole installation to the environment at a rate more than is set out in the Agency's IPPC H1 guidance note as 'significant', (or as set out in any subsequent modification issued by the Agency).

Applicant's response:

Apart from a waste discharge for removal by a licensed waste disposal contractor, there is no emission to the sewer or to other waters. There is no point source discharge to air.

3.1 j) Odour: there must be only a low potential for offence due to odour. An installation will not be considered as a Low Impact installation if it gives rise to an offensive smell noticeable outside the premises where the installation is operated. This requires the exercise of judgement, taking account of any history of odour complaint from the installation and whether this class of activity is known by experience to give rise to smells. A significant possibility or actual history of excursions or fugitive emissions, for example from stored materials, would suggest that the installation could not be treated as having a low impact. Again, this is line with the approach taken previously under IPC for 'triviality'.

Applicant's response:

Electroplating installations are not known for emitting odour. Specifically, there is no odour from a cadmium plating facility.



ENVIRONMENT
AGENCY

Application for a permit, variation, transfer or surrender Integrated Pollution Prevention and Control Pollution Prevention and Control Act 1999 Pollution Prevention and Control (England and Wales) Regulations 2000 For Part A(1) installations

Form IPPC 1 Part A - application for a permit, variation, transfer or surrender

For Environment Agency use only

Date received

Fee received: Yes ☐ No ☐

Amount received

Name assigned to installation

Introduction to Part A

When to use this form

Use this form if you are sending an application to the Environment Agency under the Pollution Prevention and Control (England and Wales) Regulations 2000 (the PPC Regulations).

The form is to be used for applications made in respect of both 'installations' and 'mobile plant' (and in the rest of the form, the term 'installation' also covers 'mobile plant' where appropriate).

Before you start to fill in this form

Please read the notes we have produced to help you with your application, called *Part A (1) Installations: Guide for Applicants*. You will also need to read the relevant Technical Guidance to which the Guide refers. The Guide contains a list of other documents you may need to refer to when you are preparing your application, and explains some of the technical terms we use.

In particular, you should make sure that you refer to the explanation of 'installation' in the Guide. For example, there may be two or more operators in a single installation. Each operator will need a permit, each obtained by a separate application. Your applications will principally relate to the part of the installation under your control, but will also need to include some information on the rest of the installation. This will help us to assess the operation of the whole installation. The term 'installation', when used in this application form (and elsewhere) may refer to either the whole or part of the installation, depending on the nature of the information we are seeking to obtain.

Which parts of the form to fill in

The form is in six parts but we usually only send you the parts you need to fill in. Everyone has to fill in Part A, and complete and sign Part F at the end of their application. The other parts you need to fill in depends on the type of application you are making:

- To apply for a new permit – fill in Parts A and B then Part F.
- To vary an existing permit – fill in Parts A and C then Part F.
- To transfer all or part of an existing permit to someone else – fill in Parts A and D then Part F. This should be a joint application by the transferor and the transferee.
- To surrender all or part of an existing permit – fill in Parts A and E then Part F.

Using continuation sheets

In the case of questions required to be answered on the application form itself, please use a continuation sheet if you need extra space; but please indicate clearly on the form that you have done so by stating a document reference number for that continuation sheet. Please also mark the continuation sheet itself clearly with the information referred to above.

If you need help and advice

We have made the application form as straightforward as possible, but please get in touch with us if you need any advice on how to set out the information we need. Please get in touch with us on 0845 933 3111.

Other documents we need to see

There are a number of other documents you will need to send us with your application. Each time a request for documents is made in the application form you will need to record a document reference number for the document or documents that you are submitting in the box provided on the form for this purpose.

Please also mark the document(s) clearly with this reference number and either the application reference number if you know it or your existing permit number. If you do not have either of these, please use the name of the installation.

If you know your Application Reference Number, please enter it into the box below:

APP 3334 SV

Please provide the information requested below about the operator, which means:

- for applications for a new permit – the person who it is proposed will have control over the installation in accordance with the permit (if granted),
- for applications for a variation, transfer or surrender – the person who currently has control over the installation in accordance with the permit.

If you are applying for a transfer, we will ask for more information relating to the proposed new operator (transferred) in Part D.

A3 About the operator

Email address Kevin@eicgroup.co.uk	
Phone number 01392 258234	
Fax number 01392 421538	
County Devon	Post town Exeter
Locality Marsh Barton	Post Code EX2 8TJ
Street address Alphin Brook Road	etc.
Address Director and Environmental Manager	
Position Kevin Baker	
Name Kevin Baker	

If different to the above, please identify the person we should contact to discuss operational matters on an ongoing basis. **After application has been made good**

A2.2 Operational contact

Email address marguis-associates@tiscali.co.uk	
Phone number 01483 723172	
Fax number 01483 757049	
County Surrey	Post town Old Woking
Locality Church Street	Post Code GU22 9SE
Street address 5 Church Street	etc.
Address David Hempley - Chief Associate	
Position Marguis Associates	
Name Marguis Associates	

A2.1 Who can we contact about your application? This could be an agent rather than the operator.

If you have someone who we can contact directly with any questions about your application. The person you name should have the authority to act on your behalf.

A2 Authorised contacts

☒ Yes
☐ No

PPC Regulations by reference to a numerical threshold.

(Please note that this definition does not apply to installations containing activities that are defined in the Environment Agency)

A1.5 Do you consider that the installation meets the criteria for a "low impact installation" as defined by the Environment Agency?

Wessex Water Services Ltd
Consent to the Discharge of Trade Effluent
28 June 1996

Permit number(s), type(s) and date(s) of issue:

discharge consents.

LAPC authorisations, waste management licences or water installation.

A1.4 Give details of any existing permit(s) for the installation.

ST 523 169

Ordnance Survey national grid reference 10 characters, for example SJ 1234 5678

County Somerset	Post town Yeovil
Locality Luffon	Post Code BH22 8RR
Street address Limber Road	etc.
Address Luffon Trading Estate	

A1.3 Please give the address of the site of the installation.

Please tell us if this name is:

☒ already agreed with the Agency; or

☐ one that you are proposing.

Cadmium plating facility - Yeovil

A1.2 Name of the installation

☒ new permit

☐ variation of an existing permit

☐ transfer of an existing permit

☐ surrender of an existing permit

A1.1 What type of application are you making?

A1 About your application

A3 About the operator continued

A3.6 Is the operator a subsidiary of a holding company within the meaning of Section 736 of the Companies Act 1985?

Yes ☒ No ☐
name of ultimate holding company

EIC Group

Street address etc.	Aglin Brook Road
Locality	Marsh Barton
Post town	Exeter
County	Devon
Post Code	EX2 8TJ

Principal office address (if different)

Street address etc.	
Locality	
Post town	
County	
Post Code	

Company registration number

381449

A4 What to do next

Now you need to fill in the other Parts of this form we sent you.

- A new permit – fill in Part B then go to Part F.
- A variation – fill in Part C then go to Part F.
- A transfer – fill in Part D then go to Part F.
- A surrender – fill in Part E then go to Part F.

A3 About the operator continued

Contact numbers

Phone number

Fax number

Email address

Now go to question A4, What to do next.

Companies or other corporate applicants

A3.5 Please give us the following details.

Full name of company or corporate body

South West Metal Finishing Ltd

Trading/business name (if different)

Registered office address

Street address etc.	Aglin Brook Road
Locality	Marsh Barton
Post town	Exeter
County	Devon
Post Code	EX2 8TJ

Principal office address (if different)

Street address etc.	
Locality	
Post town	
County	
Post Code	

Company registration number

2246273

Date of formation of company

26 August 1988

- For applications from companies, please provide a copy of the certificate of incorporation and any certificates of subsequent name changes.

Document reference number

SWMFL/102

- For applications from other corporate bodies, please provide evidence of status.

Document reference number

B2 Your proposed techniques cont.

B2.1 Describe the proposed installation activities and the proposed in-process techniques and measures to prevent and reduce waste emissions and emissions of substances and heat (including during periods of start-up or shut-down, monitoring stoppage, leak or malfunction) (section 2.1 of the relevant technical guidance).

Document reference number: **SWMFL/103**

B2.2 Describe the other proposed techniques and measures, including end of pipe abatement, to achieve the aims in B2.1.

Identify if there may be a discharge of any List I or List II substance and if any are identified, explain how the requirements of the Groundwater Regulations 1998 have been addressed (section 2.2 of the relevant technical guidance).

Document reference number: **SWMFL/104**

B2.3 Provide details of your proposed management techniques (section 2.3 of the relevant technical guidance).

Document reference number: **SWMFL/105**

B2.4 Identify the raw and auxiliary materials, other substances and water that you propose to use (section 2.4 of the relevant technical guidance).

Document reference number: **SWMFL/106**

B2.5 Characterise and quantify each waste stream from the installation and describe the proposed measures for waste management, storage and handling (section 2.5 of the relevant technical guidance).

Document reference number: **SWMFL/107**

B2.6 Describe how each waste stream is proposed to be recovered or disposed of and, if you propose any disposal, explain why recovery is technically and economically impossible and describe the measures planned to avoid or reduce any impact on the environment (section 2.6 of the relevant technical guidance).

Document reference number: **SWMFL/107**

B2.7.1 Provide a breakdown of any changes to the energy consumption and generation by source and end-use (section 2.7.1 of the relevant technical guidance).

Document reference number: **SWMFL/108**

B2.7.2 Describe the proposed basic measures for improvement of energy efficiency (section 2.7.2 of the relevant technical guidance).

Document reference number: **SWMFL/108**

B2.7.3 Are you, or will you be, subject to a Climate Change Levy Agreement?

☒ No ☐ Yes

Describe the proposed sector specific measures for improvement of energy efficiency (section 2.7.3 of the relevant technical guidance).

Document reference number: **SWMFL/108**

B1 About the installation continued

B1.2 Why is the application being made?

☒ the installation is new,

☐ it is an existing installation and you are applying in accordance with the timetable in Schedule 3 of the PPC Regulations,

☐ it is an existing installation and you have the agreement of the Environment Agency to make this application now. Please attach proof of this agreement, such as a letter from the Agency.

Document reference number for proof: **001 REID 120**

☐ it is an existing installation for which a 'substantial change' is proposed,

☐ it is for a mobile plant being moved to a new location.

B1.3 Site maps and reports

Please provide:

- a site report describing the condition of the site or that part of the installation in respect of which you are applying for a permit, and, in particular, identifying any substance in, on or under the land which may constitute a pollution risk.
- Document reference number for the report: **001 REID 120**
- suitable maps or plans showing the location of the site or the installation, the location and nature of the various activities on that site and the area of the site covered by the site report
- Document reference number for the maps or plans: **001 REID 120**

B2 Your proposed techniques

Where the Agency has published a relevant sectoral application template, Section B2 need not be completed where the Application Template is completed instead.

Please provide written information about the aspects of your installation listed below. We need this information, and that which you give in response to B3 and B4, to determine whether you will operate the installation in a way which meets all the environmental requirements of the PPC Regulations.

In each case you should:

- address all of the issues set out in the section of the relevant technical guidance identified in brackets,
- justify your proposals against any indicative requirements contained in the guidance and,
- provide any other information about the installation which you think is relevant to that issue.

B2 Your proposed techniques cont.

Please give: ☐ the (expected) date of entry into the agreement

documentary evidence to demonstrate participation in the agreement

Document reference number:

B2.8 Describe the documented system proposed to be used to identify, assess and minimise the environmental risks and hazards of accidents and their consequences (section 2.8 of the relevant technical guidance).

Document reference number:

B2.9 Describe the main sources of noise and vibration (including infrequent sources); the nearest noise sensitive locations and relevant environmental noise measurement surveys which have been undertaken; and the proposed techniques and measures for control of noise (section 2.9 of the relevant technical guidance).

Document reference number:

B2.10 Describe the proposed measures for monitoring emissions including any environmental monitoring, and the frequency, measurement methodology and evaluation procedure proposed (section 2.10 of the relevant technical guidance).

Document reference number:

B2.11 Describe the proposed measures upon definitive cessation of activities, to avoid any pollution risk and return the site of the installation to a satisfactory state (including relevant measures for the design and construction of the installation) (section 2.11 of the relevant technical guidance).

Document reference number:

B2.12 Where you are not the only operator of the installation, describe the proposed techniques and measures (including those to be undertaken jointly by yourself and other operators) for ensuring satisfactory operation of the whole installation (section 2.12 of the relevant technical guidance).

Document reference number:

B3 Your proposed emissions

Where the Agency has published a relevant sectoral application template, Section B3 need not be completed where the Application Template is completed instead.

Please provide written information about the emissions which will result from the techniques you described in response to the questions in section B2.

You should:

- address all of the issues set out in the section of the relevant technical guidance identified in brackets,
- justify your proposals against any benchmark emission levels contained in the guidance and,
- provide any other information about the installation which you think is relevant to that issue.

B3 Your proposed emissions cont.

Information required:

B3.1 Describe the nature, quantities and sources of foreseeable emissions (section 3.1 of the relevant technical guidance).

Document reference number:

B4 Impact on the environment

Please provide written information about the impact your emissions may have on the environment as listed below:

- address all of the issues set out in the section of the relevant technical guidance identified in brackets,
- justify your proposals against any indicative requirements contained in the guidance and,
- provide any other information about the installation which you think is relevant to that issue.

Information required:

B4.1 Provide an assessment of the potential significant environmental effects (including transboundary effects) of the foreseeable emissions (section 4.1 of the relevant technical guidance).

Document reference number:

B4.2 Explain how the information provided in other parts of the application also demonstrates that the relevant objectives set out in the Waste Management Licensing Regulations 1994 have been addressed (in applicable cases), or provide additional information (section 4.2 of the relevant technical guidance).

Document reference number:

B4.3 Provide an assessment of whether the installation is likely to have a significant effect on a European Site in Great Britain and, if it is, provide an assessment of the implications of the installation for that site, for the purposes of the Conservation (Natural Habitats etc.) Regulations 1994 (section 4.3 of the relevant technical guidance).

Document reference number:

B5 Environmental statements

B5.1 Has the development of the installation (or any subsequent change or extension of the development) required an environmental statement under Council Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment?

No ☒

Yes ☐ please supply a copy of the environmental statement submitted and details of any decision made.

Document reference number:

B6 Statutory consultees

We will use the information in this section to identify who we must consult about your proposals.

B6.1 In which local authority area is the installation located?
if premises are on a boundary please give names of all relevant authorities.
Borough or district council or unitary authority

B6.2 In which health authority area is the installation located?
if premises are on a boundary please give names of all relevant authorities.

B6.3 Could the installation involve the release of any substance into a sewer vested in a sewerage undertaker?
if premises are on a boundary please give names of all relevant authorities.

B6.4 Are there any sites of special scientific interest (SSSIs) which are within 2 kilometres of the installation?
if premises are on a boundary please give names of all relevant authorities.

B6.5 Are there any other SSSIs which may be affected by emissions from the installation?
if premises are on a boundary please give names of all relevant authorities.

B6.6 Are there any European sites, as defined by regulation 10 of the Conservation (Natural Habitats etc.) Regulations 1994, which may be affected by emissions from the installation?
if premises are on a boundary please give names of all relevant authorities.

Technical competence
 B7.4 Are the specified waste management activities covered by the WAMITAB (Waste Management Industry Training Advisory Board) award scheme?
 Yes ☐ go to question B7.5.
 No ☐ go to question B7.6.

WAMITAB sites

B7.5 Who will provide the technically competent management of the specified waste management activities?
 Please give details for each person and provide a copy of the WAMITAB certificate.

Responsible person	Full Name:	Position:	Level of WAMITAB certificate:	Date:	Document reference number for copy of certificate

Responsible person	Full Name:	Position:	Level of WAMITAB certificate:	Date:	Document reference number for copy of certificate

Responsible person	Full Name:	Position:	Level of WAMITAB certificate:	Date:	Document reference number for copy of certificate

Responsible person	Full Name:	Position:	Level of WAMITAB certificate:	Date:	Document reference number for copy of certificate

Now go to question B7.7.

☐ The General Permitted Development Order 1995 applies.
 please give details

☐ Planning permission is not required - please say why and enclose written confirmation from the planning authority.

Document reference number

If you have submitted an application for planning permission which has not yet been determined, please provide a copy of the application.

Document reference number

Fit and proper person

We need to make sure that whoever holds the permit is a 'fit and proper person' in relation to any specified waste management activities. This includes consideration of relevant offences, technical competence and financial provision.

Relevant offences

B7.3 Has the operator, or any other 'relevant person', been convicted of any 'relevant offence'?

A 'relevant person' includes each partner, director, manager, company secretary or any similar officer or can be an employee.

No ☐ go to question B7.4.
 Yes ☐ please give full information

Document reference number for this information

The details we need are listed below.

- Full name of company or individual convicted
- If an individual has been convicted please state their position at time of offence
- Name of court
- Date of conviction
- Offence and penalty imposed
- Date of any outstanding appeal lodged against conviction
- Any additional information which the operator would like us to take into account in determining whether they are a 'fit and proper person'. For example, why the offence happened, and what has been done to prevent a similar event occurring.

B7 Specified waste management activities continued

- 17 -

Financial provision

B7.8 If known, how does the operator intend to make financial provision for the specified waste management activities?

☐ Renewable bonds
☐ Bonds
☐ Bank guarantee

Parent company guarantee please include one copy of last three years (or for the period of trading if less than three years). These should be no more than 18 months out of date.

Document reference number for accounts

☐ Escrow account
☐ Trust fund
☐ Insurance captive
☐ Lump sum
☐ Other please specify

Expenditure plan

B7.9 Please provide a plan of the estimated expenditure for each phase of the specified waste management activities.

The plan should include the likely costs of:

- monitoring,
- restoration – landfill only,
- aftercare – landfill only,
- clearing the installation (including drainage systems) of all wastes – non-landfill,
- remedial action in the event of the failure of pollution control systems.

We recognise that this plan may need to be revised before the issue of the final permit.

Document reference number for expenditure plan

B8 What to do next

Now please fill in Part F and sign and date the application.

Non-WAMITAB sites

B7.6 Who will be responsible for managing the specified waste management activities?

Please give details for each person.

For each person named below, we:

- need to see a statement of qualifying experience,
- will want to carry out our own assessment

Responsible person

Full Name:

Position:

Document reference number for statement

Responsible person

Full Name:

Position:

Document reference number for statement

Responsible person

Full Name:

Position:

Document reference number for statement

Management of other installations

B7.7 Are any of these 'Responsible people' already providing the technically competent management at other IPPC installations or at sites licensed under Part II of the Environmental Protection Act 1990?

No ☐ go to question B7.8.
 Yes ☐ please use a separate sheet to give details of these people. For each person we need to know:

- site/installation name and address,
- licence/permit reference number,
- Document reference number for this information.

Form IPPC 1 Part F - application for a permit, variation, transfer or surrender

ENVIRONMENT AGENCY

Please complete this section after you have filled in any other parts of the application form we sent you.

F1 EP OPRA and Charges

Please calculate the appropriate charge for your application by completing the template below. To complete the template you will need to refer to the current charging scheme for PPC. Please tick all boxes that are appropriate to your application.

F1.1 Type of application

☐ **F1.1.1 New application** ☒ **F1.1.2 Variation:** (a) Non-chargeable ☐ (b) Standard ☐ (c) Substantial ☐ Are you applying for the closure of a landfill (enter yes or no)? ☐ If yes, please tick (b) Standard variation to ensure that you have identified the correct charge

F1.1.3 Transfer: (a) Part of the permit ☐ (b) The whole permit ☐ If you have ticked (a) or (b), will a Fit and Proper Person assessment be made by the Agency (enter yes or no)? ☐ If yes, remember to include the additional FAPP charge when completing section F1.4

F1.1.4 Surrender: (a) Part of the permit ☐ (b) The whole permit ☐ Staged application ☐ If ticked, go to section F1.5

F1.2 Type of permit

F1.2.1 Low impact installation permit ☒ If ticked, go to section F1.4.3 ☐ If ticked, go to section F1.4.4

F1.2.2 Standard Farm permit: (a) Large ☐ (b) Small ☐ If (a) or (b) ticked, go to section F1.4.4

F1.2.3 Directly Associated activity only (i.e. you do not undertake a listed activity) ☐ If ticked, go to section F1.4.5

F1.3 EP OPRA Summary (please complete if you have ticked F1.1.1 or F1.1.2). This is a summary of your current OPRA profile at the time of making the application.

Complexity:

Band Enter the number of activities within each band

Band	A	B	C	D	E
Operator performance					
Location					
Off-site waste					
Sewer					
Land					
Water					
Air					

Emissions:

Location	Operator performance	Amount (£)
Total OPRA charging score		

F1.4 Calculation of charge

F1.4.1 If you are applying for a new application or a variation:

F1.4.2 Total OPRA Charging score ☐ X Charge multiplier (see current charging scheme) ☐

F1.4.3 If you are applying for a transfer or surrender enter the appropriate fixed charge

F1.4.4 If you have ticked F1.2.1 enter the appropriate Low impact installation charge

F1.4.5 If you have ticked F1.2.2 (a) or (b) enter the appropriate Directly Associated activity charge

F1.4.6 Do you undertake any Part A(2) or Part B activities? If yes, how many such activities? ☐

F1.4.7 Enter the charge for each activity, £ ☐ Multiply the number of activities by the charge for each activity, and enter the total charge for your Part A(2) and Part B activities

F1.5 Invoice address

For Environment Agency use only

Sum the total charges from rows F1.4.1 to F1.4.6

Total fee enclosed £ ☐ **2695.00** X

For Environment Agency use only

Case reference ☐

Please complete this section after you have filled in any other parts of the application form we sent you.

ENVIRONMENT AGENCY

Form IPPC 1 Part F - application for a permit, variation, transfer or surrender

Yes ☐ No ☒ please give a brief summary here and provide reference numbers for supporting documents

is there any other information that you wish to submit in support of your application?

F5 Any other information

SWML/100

Document reference number for non-technical summary

Please provide a non-technical summary of your responses to all questions in Parts A to E of the application form.

F4 Non-technical summary

Date: 4.5.05

Name: L. GAVEL

Signature

I have read the data protection notice above and confirm that I have brought it to the attention of every individual named on this form.
This Section must be signed by one of the people signing the declaration in Section F6.

Data Protection Declaration

F3 Data protection notice cont.

We may also use and/or disclose any of the information you give us in order to:

- offer/provide you with our literature/services relating to environmental matters;
- consult with the public, public bodies and other organisations (for example Health and Safety Executive, local authorities, emergency services, MAFF) on environmental issues;
- carry out statistical analysis, research and development on environmental issues;
- provide public register information to enquirers;
- investigate possible breaches of environmental law and take any resulting action;
- prevent breaches of environmental law;
- assess customer service satisfaction and improve our service.

Individuals have a right to see the information we hold about them. We will correct it if it is inaccurate.

The information you give will be used by the Environment Agency to process your application. It will be placed on the relevant public register(s), and used to monitor compliance with licence/permit conditions, or to process renewal applications.

F3 Data protection notice

Do not write anything about national security on this form, nor give reference numbers to the relevant information/documents submitted.

• a copy of the application to the Secretary of State for a Direction on the issue of national security.

• full information on separate sheets.

F2.2 If there is any information in the application that you believe should be kept from the public register on the grounds of national security please attach:

Yes ☐ No ☒ please give full information

F2.1 Is there any information in the application that you wish to justify being kept from the public register on the grounds of commercial confidentiality?

F2 Commercial confidentiality and national security

F6 Signatures and declaration

It is an offence under Regulation 32 of the PPC Regulations to:

- make a statement which you know to be false or misleading in a material particular,
- recklessly make a statement which is false or misleading in a material particular,
- for the purpose of obtaining a permit (for yourself or anyone else) or seeking the variation, transfer or surrender of a permit.

If you make a false statement:

- we may prosecute you, and
- if you are convicted, you are liable to a fine or imprisonment, (or both).

Declaration

I/we certify that the information in this application is correct.

I/we apply:

- ☒ for a permit
- ☐ to vary an existing permit
- ☐ for a transfer of an existing permit (current operator(s) and proposed transferee(s) must sign below)
- ☐ to surrender an existing permit

In respect of the particulars described in this application (including supporting documentation I/we have supplied).

Signature(s) of current operator

Please note that each individual operator must sign the declaration themselves, even if an agent is acting on their behalf.

For applications from:

- more than one person -- all persons should sign below,
- a company or other corporate body -- an authorised person should sign below.

Signature



Name:

LENN BAKER

Position:

DIRECTOR & CHAIRMAN, WARRICK

Date:

Signature



Name:

Position:

Date:

F6 Signatures and declaration cont.

Signature



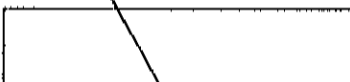
Name:

Position:

Date:

Signature(s) of proposed transferee

Signature



Name:

Position:

Date:

Signature

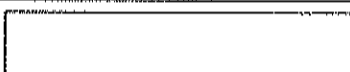


Name:

Position:

Date:

Signature



Name:

Position:

Date:

Now please return this form, together with all supporting information and correct payment, to the address below:

GRAN PRICE ESQ.
SPG
% Motivated Media Ltd
Severn Bridge
Aust

Please submit the original application plus the appropriate number of copies. You can use the table on the back of this form to calculate the number of copies needed.

Number of copies

The following table is to help you calculate the number of copies of your application that will normally be needed. You can do this by entering the number of copies required in each blank box in the column appropriate to your application, and then writing the total at the bottom. There are notes in Part A(1) *Installations: Guide for Applicants* to help you use the table.

Reason Required	Application for Permit	Application for Variation with Substantial Change ("yes" to question C1.4)	Application for: (a) Variation with no Substantial Change ("no" to question C1.4) (b) Transfer (c) Surrender
Original for Agency determination	1	1	1
Copy for Agency public register	1	1	1
Copy for Food Standards Agency	1	1	0
Copy for Local Authority public register	1		
Copy for Local Authority as statutory committee	1		0
Copy for Health Authority	1		0
Copy for Sewerage Undertaker			0
Copy for English Nature			0
Copy for Countryside Council for Wales			0
Copy for Scottish Natural Heritage			0
Copy for Harbour Authority			0
Copy for Local Fisheries Committee			0
Copy for Health and Safety Executive	1		0
Copy for Planning Authority			0
Copy for Secretary of State for Wales			0
Total submission	1 original plus 5 copies	1 original plus copies	1 original plus copies

an authorised officer

Cardiff the 26 AUGUST 1988

Given under my hand at the Companies Registration Office,

SOUTH WEST METAL FINISHING LIMITED

is now incorporated under the name of

having by special resolution changed its name,
PANGATE LIMITED

I hereby certify that

No. 2246273

ON CHANGE OF NAME

CERTIFICATE OF INCORPORATION



FILE COPY

DRN	Section	Title	Date
SWMFL/102	Company Certificate of Incorporation	3.04.05	

DRN	Section	Title	Date
SWMFL/103	B2.1	Description of the Proposed Installation	3.04.05

Overview

The cadmium plating facility utilises a conventional process with a sodium cyanide based electrolyte as required by Westland Transmissions Ltd's Plating Specification (*vide* Appendix I).

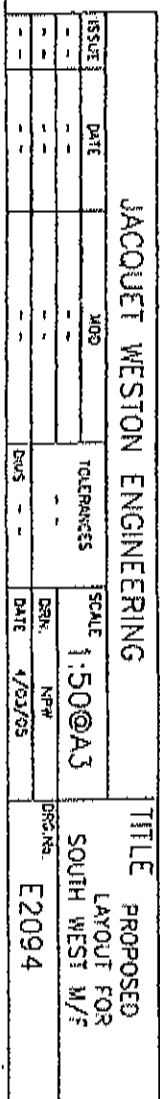
The work to be treated is degreased cleaned and dried in an aqueous alkaline cleaner in a proprietary washing machine. There is no vapour phase or solvent cleaning on site. The work is then transferred to the plating line, either directly or via a masking and grit blasting process, for jigging up and loading onto the line. The plating line is able to treat mild and stainless steel parts (the latter represents about 40% of the overall work and requires a nickel plated 'strike' deposit prior to cadmium plating). Following plating, the work is inspected prior to its passivation in an acid sodium dichromate solution according to a WHL specification. After passivation, the work is dried and further inspected before return to the Goods In and Out area for packing.

The line employs multi cascade rinsing stations so the water consumption is typically 24 l / h. About 6 l / h is used as make-up lost through natural evaporation from the surfaces of the several process tanks. The alkaline cleaner, chromium, nickel and cadmium containing rinse waters are passed to a wastewater reduction unit (an elevated natural evaporation tank at 50-55° C) for its reduction to a concentrated liquor for routine disposal by a licensed waste disposal contractor. The wastewater reduction unit is a warm natural evaporation pond. There is no discharge of rinse water to the site ETP.

The plating line has two parallel lines connected by a cross shuttle rinse tank. Both lines have a semi-automated with a single transport robot for the jigged work. The operator moves the robot in accord with the desired process sequence and process times.

The entire installation with the exception of the Goods In and Out, work inspection area, the aqueous cleaning machine and masking-demasking-grit blasting is contained within a bunded and tiled area for the containment of accidental spillage. The bund is large enough to contain the equivalent of 25 % of the total process volume and 110% of the volume of the largest process tank. It should be noted that the bunded area is large enough to allow storage space for the input process chemicals (with provision for the safe separation of acid and alkaline substances) and for waste liquor awaiting removal by a licensed waste disposal contractor. The bund area has a sump with an alarm and manually operated pumping system for the collection and control of accidental spillage.

A hot water generator provides process heating for the Cadmium Plating Facility. The boundary of the installation, marked in green, is shown in ASR Document 001 Reid 120. The installation's layout plan is shown in Figure 1.



DRN	Section	Title	Date
SWMFL/103	B2.1	Description of the Proposed Installation	3.04.05

After the aqueous cleaning, masking-demasking and grit abrasion (according to the type of work), the work is transferred to the plating line.

Type of work	Steel	Stainless steel
Load		
Aqueous clean		
Anodic clean		
Cascade rinse - three stage		
Hydrochloric acid activate (10%)		Nickel strike
Cascade rinse - three stages		
Cadmium plate - two tanks, one with a single flight bar, the other with twin flight bars		
Cascade rinse - cross shuttle rinse followed by a five stage rinse		
Sulphuric acid activate (0.5%)		
rinse		
Yellow passivate		
Cascade rinse – four stages with final rinse at 55°C		
Hot air dry		
Unload		

Jig strip and twin rinse (as required)

Figure 2 Process Sequence

DRN	Section	Title	Date
SWMFL/103	B2.1	Description of the proposed installation	3.04.05

There is no necessity for a fume extraction system on any of the process tanks as the local environment for the operating personnel, based on experience with a similar cadmium plating plant at SWMFL's Exeter site, is well within the limits set by the COSHH Regulations. There are therefore no point source emissions to air.

The cleanliness of the two cadmium plating tanks is maintained by a continuous cartridge filtration system.

The agitation of all the rinse tanks and the passivate process tank is provided by a dedicated low-pressure air blower.

Energy and evaporation losses from the final hot water rinse tank are minimised by restricting the operating temperature to 55°C, insulation of the tank walls and the use of tank lid.

The bundled floor of the plating line and its associated equipment will be covered with acid resistant tiles using epoxy grouting. The walls of the bundled area will be similarly tiled.

All process chemicals associated with the installation will be stored within the bundled area.

The tank schedule, giving the tank and other equipment sizes, and operational information is shown in Figure 3.

Client: South West M/F

[illegible]

DRN	Section	Title	Date
SWM/FL/103	B2.1	Description of the Proposed Installation	3.04.05

Production Operations

The installation will routinely operate on a 10 h single shift basis for 5 days per week and 48 weeks per year. A plating line utilisation efficiency of 80% is expected, i.e. an annual operational period of 1920 h.

Installation Output

Area of work to be processed : 0.32 m² / flight bar
Plating time : 40 min

Plated deposit thickness : 12 micron

Flight bar output-single FB tank : 1.5 / h
double FB tank : 3.0 / h

Total flight bar output : 4.5 / h

Maximum processed work area : 1.4 m² / h (14 m²/ day)

Annual area of work processed : 2,688 m² (1920 h)

DRN	Section	Title	Date
SWMFL/104	B2.2	Other Proposed Techniques to Achieve the Aims of B2.1	3.04.05

The principal cause of a low input materials efficiency and potential contamination of the environment is the drag-out of process fluids when the work being processed is transferred along the plating line.

The process design of the installation includes a range of Best Available Techniques to maximise the efficient use of input materials. These are:

1. The setting of a minimum time for the drainage of the work above the process tank of 10 s before the robot can be moved to the next station.

2. The use of multi-stage cascade rinsing to minimise water consumption and contamination of the following process station. In the case of the cadmium plating station and its associated five stage rinse station, the input water flow is low enough for the rinse overflow to be used as make-up for the natural evaporation from the surface of the warm plating station. There is therefore no loss of cadmium and the associated plating electrolyte apart from any accidental spill and the very infrequent removal of excess sodium ions. The closed loop plating system is therefore achieved without recourse to external electrolytic removal of cadmium from the drag-out or ion exchange technology, neither of which is able to return the drag-out metal or electrolyte chemicals to the plating electrolyte.

3. The complete return of drag-out is not possible with ambient temperature processes, so the contaminated rinse waters from the other multistage rinse stations are collected for water removal by evaporation in a wastewater reduction unit. The concentrated liquor, containing small quantities of chromium, nickel and cadmium (the latter from metal dissolved from the plated work during the passivation process and from the jig tip stripping tank, is routinely removed by a licensed waste disposal contractor.

4. Low temperature process systems, e.g. the aqueous cleaner, have been chosen for the plating line. No process station operates at a temperature in excess of 55°C, so process tank ventilation is not employed, representing a further saving in energy.

5. The plating electrolyte is continuously filtered to ensure a high standard of plating and a long electrolyte life.

6. No vapour phase or solvent dip cleaning is carried out.

DRN	Section	Title	Date
SWMFL/105	B2.3	Management Techniques	3.04.05

SWMFL has a full range of formal management techniques relating to operational, plant maintenance and environmental procedures. It was successful in securing accreditation for the ISO 14001 Environmental Management Standard for its main site at Exeter in January 2000.

The existing formal management procedures (with adaptation as necessary) will be put into operation at the Yeovil site as soon as the Cadmium Plating Facility has been commissioned and is in commercial operation.

The key management and operational procedures will be (but not necessarily limited to):

1. Waste disposal
2. Spillage procedures
3. Inspection of pipework
4. Inspection of the bund and bund floor
5. Emergency Maintenance Work
6. Materials Handling
7. Materials Storage
8. Use of Spill kits
9. Reporting of 'Near Misses'
10. The Addition of Maintenance and Make-up Process Chemicals.
11. Emergency plan

DRN	Section	Title	Date
SWM/FL/106	B2.4	Input materials	3.04.05

Process chemicals

The following table shows the input materials, maximum storage levels and the expected annual usage:

Input Material **In store-kg (max)** **Usage - kg /annum**

Proprietary alkaline cleaners	25	100
Proprietary anodic cleaner	25	100
Hydrochloric acid – 28-32%	45	600
Nickel chloride	10	20
Sulphuric acid (96%)	45	45
Sodium cyanide	10	20
Sodium hydroxide	25	50
Cadmium cyanide	nil	negligible
Cadmium anode balls	10	70
Sodium dichromate	10	25
Cadmium stripping salt	25	50

Except for those chemicals associated with the make-up of the cadmium plating station electrolyte, the above chemicals are routinely required as maintenance materials as make-up for their loss to the rinsing stations as drag-out from the preceding process tank. Drag-out is a function of the drainage time of the work whilst held over the process tank, so a minimum drainage time of 10 s is specified for the robot's stationary period between movements.

All process chemicals are stored within the bunded area of the installation

DRN	Section	Title	Date
SWMFL/106	B2.4	Input materials	3.04.05

Town's Water

The water is fairly hard, so all water supplied to the installation, whether for the initial make-up of the process fluids, evaporation losses or for rinsing, is deionised. The use of deionised water prolongs the life of the process fluids by minimising the build-up of calcium and magnesium salts as well as other contaminants. There is therefore a small ion-exchange unit and storage tank of 50 l / h output located within the bunded area of the installation. The regenerates are passed to the site effluent treatment plant.

The consumption of water is extremely low due to the use of multistage cascade rinsing. A further saving is effected by the reuse of water from the post hydrochloric acid/nickel strike rinse station as a feed to the post alkaline anodic clean rinse station.

Rinse Station Consumptions

	Cascade	Flow- l / h	Remarks
1. Post anodic clean	3	10	fed from rinse 2, (3 l lost by tank evaporation, 7 l sent to evaporation pond)
2. Post hydrochloric acid or post nickel strike	3	10	sent to rinse 1
3. Post cadmium plating tanks	6	3	closed loop (all water lost by evaporation)
4. Post sulphuric acid activate	1	3	sent to evaporation pond
5. Post passivate	4	5	trace cadmium, sent to evaporation pond
6. Post jig strip	2	3	trace cadmium, sent to evaporation pond
Total flow - IN		: 24 l / h	
Flow to evaporation pond		: 18 l / h	
Natural evaporation from tanks		: 6 l	

DRN	Section	B2.4	Input Materials	Date
				3.04.05

Water Mass Balance

The water mass balance is shown in Figure 4.

Cadmium Mass Balance

By far the largest transfer of cadmium to the rinsing system is that from the plating tank. The use of multistage rinsing and operation of the electrolyte at 30°C allows the very small flow of rinse water to be sent directly to the plating tank thus enabling the operation of a closed loop. There is a small loss of electrolyte when the cartridges of the plating electrolyte filtration system require changing (electrolyte still contained within the filter medium after draining). The used cartridges are removed by a licensed waste disposal contractor.

There is a very small loss of cadmium through the dissolution of the cadmium plate when the work is processed in the slightly acid yellow passivate process tank. Another loss is the occasional removal of cadmium that has plated onto the electrical contact tips of the jigs carrying the work. Rinse waters from these two processes are therefore sent to a low temperature evaporation pond for volume reduction before being removed by a licensed waste disposal contractor.

Experience at SWMFL's Exeter site and that from other operators using the Marquis approach has been used to develop a cadmium mass balance:

Cadmium concentration in the yellow passivate after one year of use	: 1 g / l
Average cadmium concentration	: 0.5 g / l
Drag-out loss (<i>Envirowise</i> - IT265 EPPOT)	
work processed	: 14 m ² / day
drag-out coefficient	: 0.15 l / m ²
drag-out (8 productive h / day)	: 1.8 l / day
average cadmium loss	: 0.9 g / day
	: 0.2 kg / annum

240 l / day
TOTAL

240 l / day
Rinse water

WATER - IN

Waste Water
Reduction Unit

Plating Plant

240 l / day
TOTAL

6 l / day
Waste liquor

174 l / day
Humid air

60 l / day
Evaporation

WATER - OUT

Figure 4 Water Balance

DRN	Section	Title	Input Materials	3.04.05
-----	---------	-------	-----------------	---------

Cadmium lost to the jig stripper

work processed : 14 m²/day
area of plated jig tips as a % of work area : 0.5 %
plated jig tip area : 0.014 m²
cadmium anode consumption : 0.3 kg / day
cadmium dissolution rate in the jig stripper : 0.3 g / day
0.1 kg / annum

sub-standard work stripped for replating

reject rate (out of specification work) : 3%
cadmium lost to the jig stripper : 9 g / day
2.2 kg / annum

Total cadmium loss to the evaporator : 10.2 g / day
2.5 kg / annum

Loss in the discarded filter cartridges : 0.5 kg / annum

Note that 73 % of the cadmium loss is due to out of specification work

In-kg / annum	Out-kg / annum
Cadmium balls	70
The plated deposit	67
Loss to water	nil
Loss to air	nil
Loss to land fill	2.5 (2.2 for recycled plating)
ex-evaporator	
Dirty filter cartridges	0.5

Cadmium materials efficiency - 96%, or
99% excluding recycled plated work

Figure 5 Cadmium Mass Balance

DRN	Section	Title	Date
SWMFL/107	2.5 & 2.6	Emissions to Air and Water	3.04.05

1. Emission to Air

There is no emission to air

2. Emission to Water

There is no discharge of water to land, controlled waters or the sewer.

3. Emission as Process Waste

The annual quantity of aqueous process waste containing chromium, nickel and cadmium is:

Volume : 1,332 l (one 205 l drum every 8 weeks)

Heavy metals concentration

chromium : 7.5 g / l (ratio of chromium to cadmium based on experience at Portsmouth Aviation Ltd)

cadmium : 1.88 g / l

nickel : 32.3 g / l

There are also approximately 50 dirty plating electrolyte filter cartridges to be removed per annum by a licensed waste disposal contractor.

4. Ordinary Waste

Ordinary waste comprising paper and card packing is less than 500 kg / annum.

DRN	Section	Title	Date
SWMFL/108	B2.7	Energy	3.04.05

The installation uses electricity and Calor gas for its energy requirements. There is no consumption of natural gas or fuel oil.

Electricity is used for the supply of direct current power to the nickel strike and cadmium electroplating process tanks and for the anodic cleaner station.

Calor gas is used for process heating purposes.

The annual consumption of electricity is estimated to be : 30,000 kWh

The annual consumption of Calor gas is equivalent to : 48,000 kWh

The annual total energy usage is : 78,000 kWh

2.7.1 The main energy consumptions

Gas - kWh	Electricity - kWh
Electrochemical processes	15,000
Process tank heating	30,000
Hot air drier	18,000
Agitation air blower	5,000
Robot motors, pumps	10,000

Note: the process heating source is low pressure hot water at 85°C supplied from a Calor gas fired generator.

2.7.2 Energy efficiency measures

1. The lowest process temperatures consistent with satisfactory process operation are employed wherever possible
2. The hot process tanks are insulated
3. The hot final rinse tank is fitted with a lid to minimise heat loss through evaporation
4. The hot air drier is only operated as required

6. Efficient thyristor rectifiers with automatic current control for the supply of direct current will be used

DRN	Section	Title	Date
SWMFL/108	B2.7	Energy	3.04.05

2.7.3 Climate Change Levy

The energy cost is so small (approx.£3,000 pa), the financial benefit from the CCL energy rebate (£240 pa) is less than the annual cost of operating a CCL Scheme (subscription fees to the Surface Engineering Association and internal administration overheads would be £500). SWMFL does not therefore propose to join the SEA Scheme.

DRN	Section	Title	Accidents and their Consequences	3.04.05
SWMFL/109	B2.8			

Risk Assessment

2.8.1 Assessing the Risks

The major risks to the environment from hazardous materials used by SWMFL are:

- Hazardous liquid spillage into groundwater or surface water during delivery of chemicals, storage or handling/movement around the site.
- Escape of hazardous waste materials during storage or collection for off-site disposal.
- Exothermic reactions caused by mixing of incompatible chemicals.
- Vandalism.
- Fire.

The first two risks are minimised by locating all chemicals storage areas and hazardous storage areas inside the bunded area of the installation. Deliveries of chemicals and collections of waste are carried out at a designated point.

The following table summarises the measures that SWMFL will implement to prevent accidents and to limit any consequences.

DRN	Section	Title	Accidents and their Consequences	Date
SWMFL/109	B2.8			3.04.05

Table – Accident prevention measures

Hazard	Probability of Occurrence	Pathway, receptor and consequence	Measures to Reduce the Risk
Accidental spillage of small quantities of sulphuric, nitric and hydrochloric acids and sodium hydroxide solution from damage to 45 litre plastic containers during delivery or movement around the installation.	Moderate	Run-off into the bunded sump, and from there to the evaporation unit.	All 45 litre plastic containers of acid and alkali are stored in the roofed bunded area of the installation. When acid and alkali is required from the containers it is carefully decanted within the bunded area into suitable containers to transport to the process tank.
Accidental spillage of small quantities of process chemicals from damage to containers during delivery or movement around the installation.	Moderate	ditto	All containers of process chemicals are stored in solid form within the installation.
Accidental spillage of small quantities of cyanide based materials from damage to containers during delivery or movement around the installation.	Moderate	ditto	All cyanide based chemicals are stored in solid form within the bunded area of the installation.
Escape of hazardous waste material from damage to containers during storage and collection from the installation	Moderate	ditto	Special waste contained in 205 litre drums or 1000 l IBCs is stored on pallets within the bunded area of the installation.

DRN	Section	Title	Date
SWMFL/109	B2.8	Accidents and their Consequences	3.04.05

Hazard	Probability of Occurrence	Pathway, receptor and consequence	Measures to Reduce the Risk
Fire associated with flammable materials within the facility creating noxious fumes and smoke and giving rise to contaminated fire-fighting water.	Low	Run-off into site bounded area which would then be pumped to a tanker for off-site disposal.	All chemical storage areas and hazardous waste storage areas are located within the bounded area of the installation. Site emergency plans include fire prevention practices.
Vandalism resulting in uncontrolled release of oils, chemicals or wastes.	Low	Run-off into site bounded area which would then be pumped to effluent treatment plant for treatment.	The installation is located within the factory building. The site is surrounded by a high level security fence. There are no public rights of way (footpaths etc) adjacent to the perimeter of the site. The gate providing vehicle access to the site area is kept locked at all times. Out of hours, the site is fully alarmed and regularly patrolled by security staff. There are no public rights of way (footpaths etc) adjacent to the perimeter of the site. Out of hours, the factory is secured and fully alarmed.

DRN	Section	Title	Date
SWMFL/109	B2.8	Accidents and their Consequences	3.04.05

2.8.2 Techniques to Reduce the Risks

General Provisions

SWMFL operates good industry practice for handling and managing potentially polluting materials and these provisions (eg bunding, containment and quarterly inspection as part of the maintenance management system) are described elsewhere in this document. This section focuses upon the emergency response provisions at the site.

The Environmental Manager is responsible for dealing with emergency or non-standard operating conditions that have been identified as having environmental implications (eg spillages, pollution control equipment failure). The Environmental Manager is supported by a team of trained personnel, comprising the External Training Officer and Operations Manager.

All necessary information describing actions to be taken in the event of an emergency are contained in the emergency plan which is posted at various locations in the factory. The plan contains:

- a factory plan which identifies the shut-off points for electricity, gas and water and how to turn each one on and off;
- a list of emergency contact numbers for the Fire Brigade, Police, Water Company, Environment Agency etc;
- a list of out-of-hours contact numbers for the Environmental Manager and other personnel in the emergency response team

The plan is regularly reviewed and amended in the event of any changes to work procedures

The plan allows for dealing with situations such as spillages, plant failure, fires etc. Staff are trained and practised in implementing the emergency plan and SWMFL regularly tests it by carrying out a simulated incident each year.

All areas where potentially polluting materials are stored or handled are regularly inspected and the results of the inspections are documented.

DRN	Section	Title	Date
SWMFL/109	B2.8	Accidents and their Consequences	3.04.05

2.8.3 Emergency Response Actions

The emergency response actions for the site are as follows:

- The Environmental Manager, or, in his absence a senior member of staff, will be notified and will decide upon the action to be taken. The Environmental Manager will notify the Authorities where appropriate.
- All spillages will be contained within the bunded area of the installation.

- In the event of a leak, further leakages will be stopped and leaked substances prevented from migrating via site service corridors or other conduits (eg drains and ducts). Spilled material will be prevented from escaping from the site by collection within the site bunded area.

- In the unlikely event of a spill in the car park area, infiltration via unsurfaced ground will be prevented (eg absorbent material will be thrown down or spilled material channelled away from unsurfaced ground).

- All spill incidents will be documented, including the actions taken and final outcome. Incident reports will be reviewed at management review meetings to decide whether changes to operations are required.

Materials contaminated with the leaked substance will be handled carefully and properly disposed of in accordance with the Duty of Care Regulations. Waste will be collected and deposited in polythene type bags (and/or lidded drums), clearly identified and labelled with the contents, and disposed of via approved Waste Contractors. SWMF proposes to review the provision of materials for containing spillages (eg absorbents, overpacked drums etc) as part of the improvement programme in the IPPC permit.

DRN	Section	B2.8	Accidents and their Consequences	3.04.05
	Title			Date

2.8.4 Incident Reporting Procedure

Depending on the specific circumstances of the incident, a number of the emergency and regulatory authorities will be contacted. Three reporting levels will be considered for the reporting of incidents.

Level 1: Life and Property Threatening Incidents.

The first level of reporting will be concerned with personal safety as first priority and significant property damage. Those parties to be informed will be involved in dealing with injured people and preventing fire and explosion, eg Ambulance, Fire Brigade, Police.

Level 2: Potentially Polluting Incidents

Once the site has been made safe in terms of an immediate fire and explosion risk, the Environmental Manager will initiate the second level reporting actions concerned with informing those parties whose responsibility it is to protect sources from the impact of the release, eg the Environment Agency, Water Company and Local Authority. These parties will be contacted once the site has been made safe.

Level 3: Minor Incidents

If the incident has not resulted in any health and safety or off-site environmental impact, external reporting of the incident will not be necessary unless required by the IPPC Permit. The majority of minor spillages will fall into this category. However, the incident will still be responded to, investigate and reported internally in accordance with the site's EMS.

Accidents and their Consequences Summary

SWMFL has recognised the potential for accidents to occur and in particular in relation to potentially polluting materials such as acids, alkalis and other process chemicals. In the light of this the primary focus has been to locate all storage and handling activities within the site bounded area.

Chemical storage and waste storage areas are also protected by separate roofed bunds, thus each area is bunded twice. All chemical and effluent pipework external to the building is located in the site bounded area. Suitable containers are used to transport small quantities of chemicals to and from stores as required. Again, all handling operations outside the building are carried out within the site bounded area.

In terms of emergency response provision, SWMFL has a site-wide emergency response programme that included detailed response actions reporting levels for various incidents. All incidents or near misses will be investigated and documented.

DRN	Section	Title	Date
SWMFL/110	B2.9	Noise, vibration and odour	20.04.05

There are no noise issues

The only static source of noise within the installation is a small air blower that provides air for the process and rinse tank agitation systems. There is no fume extraction, and external stack that could generate noise at the boundary.

Vibration

There is no equipment within the installation that generates vibration.

Odour

There is not likely to be any odour emanating from the installation.

The Directors have received no complaints relating to noise, vibration or odour from the adjacent businesses, the local council or the public emanating from the site as a whole during the last ten years.

DRN	Section	Title	Date
SWMFL/111	B2.10	Monitoring	23.04.05

Waste to be removed by a licensed waste disposal contractor

The chromium, nickel and cadmium containing rinse waters from the installation are reduced in volume in an evaporation pond such that removal by a licensed waste contractor on a routine basis is economical. The concentrated liquor is stored and transported in 205 litre drums or 1000 l IBCs.

Volume : 1,332 l / annum

Concentration
chromium : 9 g / l
nickel : 32.3 g / l
cadmium : 1.9 g / l

Mass discharge
chromium : 12 kg / annum
nickel : 43 kg / annum
cadmium : 2.5kg / annum

The contents of the evaporation pond will be analysed on a regular basis for chromium and cadmium. A further analysis for these metals will be carried out by SWMFL prior to removal of the evaporation pond contents by a licensed waste disposal contractor

DRN	Section	Title	Date
SWMFL/112	B2.11	Site closure	27.04.05

A provisional Site Closure Plan is given below. This Plan will be updated and implemented immediately following a permanent cessation of production operations.

Provisional Site Closure Plan

The closure operation will be carried out by a licensed disposal contractor in accord with an operational plan developed in conjunction with the Operator. The principal actions will include (but not necessarily limited to) the following:

1. Drain all process tanks directly to a suitable bulk road tanker in a controlled manner.

2. Drain the rinse tanks to a bulk road tanker.

3. Remove any sludge from the tank bottoms and transfer to a bulk road tanker.

4. Wash out all process and rinse tanks. Drain the washings to the foul sewer.

5. Wash out all process pumps and pipelines.

6. Empty and wash out all chemicals storage tanks to a bulk road tanker.

7. Drain oils and other non-aqueous fluids from equipment for removal by a licensed waste disposal contractor.

8. Dismantle and remove the process plant, rectifiers and other ancillary equipment. This work is to be carried out by a qualified contractor.

9. Clean and wash down the building floor.

10. Prepare a formal Site Closure Report for the Environment Agency.

DRN	Section	Title	Emission Benchmarks	Date
SWMFL/113	B3			27.04.05

Emission to foul sewer

There are no emissions

Emission to air

There are no emissions

DRN	Section	B4	SWMFL/114	Impact	Date
					27.04.05

The discharge of hazardous waste liquor from the installation, for removal by a licensed waste disposal contractor, is approximately 1350 kg / annum.

Approximately 50 dirty plating electrolyte filter cartridges containing a total of 0.5 kg cadmium are also removed by a licensed waste disposal contractor.

DRN	Section	Title	Improvement Programme	Date
				27.04.05

The installation is new and its design includes the appropriate Best Available Techniques listed in EA Guidance IPCC S2.07. We foresee no improvement programme at this time.

WESTLAND HELICOPTER PROCESS SPECIFICATION					
CADMIUM PLATING PUBLICATION NOTICE					
WHPs 257 Issue 14 has been fully revised, and is raised to Issue 15 AIS Nos. 7, 8, 10, 11 & 12 have been incorporated into this Issue. AIS No. 5 Sikorsky Supplement and AIS No. 6 Saab-Scania Supplement have been cancelled by this issue.					
DOCUMENT REVIEWED AND ACCEPTED BY ... FOR SWMF					
Note ... This document contains a Boeing-Mesa Supplement – See Page 13 An Agusta Supplement – See Page 16					
IDENTITY:					
ISSUE	DATED:	COMPILED:	EDITED:	MAT. LAB:	STRESS:
15	December 2004	B R Terry	J R Jagla	R F Williams	
WESTLAND HELICOPTERS LTD. YEOVIL ENGLAND					
Ownership of and copyright in this document belong to Westland Helicopters Limited ("WHL"). The document is confidential and must not be disclosed, copied, reproduced in whole or in part or supplied to or used by any person or company, unless authorised in writing by WHL. Reference only - This document is subject to restrictions in its use Westland Helicopters Limited is an AgustaWestland					

1. SCOPE

1.1 This specification details the requirements for the electroplating of Cadmium onto ferrous and copper alloys by the Vat and Barrel processes.

1.2 The preferred method is the Vat process, however, the Barrel process may be used for plating small components e.g. bolts and screws, which cannot for practical purposes be plated in a vat.

1.3 Components requiring local cadmium plating shall be treated in accordance with WHPS 097. Components requiring dyeing after cadmium plating shall be treated in accordance with WHPS 174.

2. REFERENCED DOCUMENTATION

2.1 This specification makes reference to the following documents, which shall be used at their latest issue, unless specified to the contrary.

WHPS 000	The Control and Use of Westland Helicopters Limited's Process, Procedure and Material Specifications.
WHPS 006	De-Embrittlement and Low Temperature Stress Relief of Steel Parts.
WHPS 031	Phosphating of Non-Stainless Steels.
WHPS 097	Selective Brush Plating.
WHPS 158	The Protection of Metallic and Non-Metallic Items.
WHPS 174	Dyeing of Cadmium Plated Components.
WHPS 256	Cleaning of Surfaces.
WHPS 389	Process Control by Chemical Analysis.
WHPS 644	Training and Approval of Personnel Performing Special Processes.
WHPS 678	Vacuum Deposition of Cadmium.
ASTM B-117	Standard Practice for Operating Salt Spray (Fog) Apparatus.
BS 2868	Specification for Cadmium Anodes and Cadmium Oxide for Electroplating.
BS 7479	Method for Salt Spray Corrosion Tests in Artificial Atmospheres.
DEF STAN 03-19	Electro-Deposition of Cadmium.
AMS 6345	Steel, Sheet, Strip, and Plate 0.95 Cr - 0.20 Mo (0.28-0.33 C) (SAE 4130), Normalized or Otherwise Heat Treated.
MP 62.11.50	Electrolytic Cadmium.
DHN 1-005	Selection of Protective Coatings and Painting Procedures Suitable for Various Helicopter Production Programmes.

2.2 In the event of conflict between the requirements of this specification and any referenced document above, this specification shall take precedence.

2.3 In addition to the requirements of this specification users shall ensure compliance with any paragraph in WHPS 000, which is applicable to them.

3. HEALTH, SAFETY AND ENVIRONMENTAL PROTECTION

3.1 This specification requires the use of certain hazardous or dangerous materials.

3.2 All users must ensure that they meet their legal obligations to undertake an assessment of risks to health resulting from the use of hazardous or dangerous substances. If the specification is for use in the United Kingdom, then such assessments are subject to the provisions of the Control of Substances Hazardous to Health Regulations 2002 (COSHH) and associated regulations, including the requirement that all persons involved in the handling, use and storage of hazardous or dangerous materials must receive adequate training, instruction and information to undertake the work in a safe manner. If the specification is for use in a country or countries other than the United Kingdom, the user is responsible for ensuring that all such assessments meet the legal requirements of the country or countries concerned.

3.3 All users must ensure additionally that they meet their legal obligations with regard to environmental protection. If this specification is for use in the United Kingdom, all of the requirements of the Environmental Protection Act 1990 and the Environmental Protection (Prescribed Processes and Substances) Regulations 1991 must be satisfied. If this specification is for use in a country or countries other than the United Kingdom, the user is responsible for ensuring that the legal requirements are met in full of the country or countries concerned.

3.4 Additional advice or information may be obtained from the Westland Helicopters Ltd. (WHL) Safety & Environment Department, but the giving of such advice or information shall not relieve the user in any manner from its legal obligations and responsibilities referred to above.

4. QUALITY REQUIREMENTS FOR SUPPLIERS

Suppliers operating this WHL process shall be:

- a) Approved by WHL
- b) Listed in the Vendor Approvals Database.

5. OPERATOR TRAINING

All personnel operating this process shall be trained and approved to a standard procedure equivalent to that detailed in WHPS 644.

6. PROCESS CONTROL AND QUALITY RECORDS

6.1 All process control test results shall be considered Quality Records. They shall be held on file as hard copies and made available to Westland Helicopters Ltd. for audit.

6.2 Process controls shall be as detailed in Paras. 11 and 12.

7. DESIGN REQUIREMENTS

7.1 General Requirements

7.1.1 The treatments required for ferrous components are dependent on the type of steel and its tensile strength. The exact requirements are detailed in Table 1.

7.1.2 The treatments required for copper alloys shall be as detailed in Table 1.

7.1.3 The thickness of plating shall meet the requirements of Para. 7.2.

7.1.4 All cadmium plated surfaces shall be chromate passivated unless otherwise specified by drawing.

7.1.5 EH101 parts with a maximum tensile strength greater than 1450 MPa and parts for all other aircraft with a maximum tensile strength above 1800 MPa shall not be Vat or Barrel plated. These parts shall be Vacuum Cadmium Plated in accordance with WHPS 678.

7.2 Thickness requirements

7.2.1 The normal thickness requirements, as well as those for threaded components and washers are detailed in Tables 2-4.

7.2.2 The thickness requirements for copper based materials is inclusive of any nickel undercoating.

7.2.3 As dictated by thickness tolerance limits, Table 3 details the coating thicknesses required to be applied to the threads of threaded components. Such thicknesses may not necessarily provide the remaining unthreaded areas of the components with an adequate protection against corrosion.

7.2.4 For thickness requirements on Eurocopier components, refer to MP 62.11.50 and DHN I-005.

7.2.5 For AB139 components, a minimum thickness of 13 microns is required.

8. PLANT

8.1 Tanks

8.1.1 Tanks shall be made of a suitable material so as that the chemistry of the bath is not affected. The tanks may be lined or unlined and shall be capable of withstanding the temperature of the process.

8.1.2 Tanks shall be fitted with the following:

- a) Fume extraction.
- b) A suitable method of heating the process.
- c) Air agitation (filtered free from oil and water).
- d) A suitably scaled and calibrated temperature gauge.

8.2 Rectifiers

8.2.1 The rectifiers shall be fitted with suitably scaled ammeters and voltmeters and be capable of delivering the current and voltage required.

8.3 Anodes and Salts

8.3.1 The following materials shall be ordered and certified by the supplier as being free from mercury:

- Proprietary salts or chemicals for initial make up of the plating solution.
- Cadmium oxide meeting BS 2868 and sodium cyanide for maintenance of the electrolyte.
- Cadmium anodes meeting the requirements of BS 2868.

8.4 Jigging

8.4.1 The main purposes of jigging is:

- To hold components during processing.
- To distribute the current to the component during electrolytic processes such as anodic pickling or plating in such a way as to prevent local arc burning.

8.4.2 It is preferable that the position of contact with the component is in an area that does not require plating. If this is not feasible then the component shall be moved during the plating process such that the whole of the required area is plated. WIRE MARKS ARE NOT ACCEPTABLE.

8.4.3 For some components, it may be necessary to have more than one area of electrical contact. In addition, it may be necessary to use auxiliary anode or robbers/shields to obtain an acceptable deposit on areas of low or high current density.

8.4.4 Hooks shall not be used as electrical contact with the component but it is permissible to use insulated hooks as a method of supporting the component in the plating bath.

8.4.5 Components may be suspended from copper wire, provided there is sufficient wire contact to adequately carry the current to the component without localised heating or arc burning. The wire diameter shall be such that it is suitable for the part being plated and not be excessive for small parts.

8.4.6 If specific jigs are used they shall conform to the following:

- The electrical contacts between the component and the fixture shall be provided by an assembly ensuring continual tightness.
- The area of electrical contact between the component and the fixture shall be sufficient to ensure adequate current carrying capacity and that no localised heating or arc burning occurs.
- It is beneficial to mask fixtures, except any areas that are acting as robbers, to improve current density distribution on the component.
- Sections of the fixture where electrical continuity is not necessary may be made from an insulating material not affected by the plating solution (e.g. Acrylic sheet, reinforced plastics, PTFE etc.).

9. SOLUTIONS

9.1 All plating and passivation solutions shall be made up and maintained with distilled or demineralised water with a maximum conductivity of $50 \mu\text{S cm}^{-1}$.

9.2 Whilst the following solutions are preferred, those detailed in the current issue of DBF STAN 03-19 may also be used. No other solution shall be used without the prior written agreement of the WHL Materials Laboratory.

NOTE: IT IS PROHIBITED TO PLATE STEELS IN BRIGHTENED SOLUTIONS.

9.3 Cadmium Plating Solutions.

9.3.1 Vat (Bath) Plating

Cadmium (as metal)
Total cyanide (as Sodium cyanide)
Free Sodium hydroxide
Carbonate (as Sodium carbonate)
Temperature
Current density

12-20 g/l
38-56 g/l
4-10 g/l
100 g/l maximum
15-35°C
0.75-1.1 Amps/dm² (7-10 Amps/ft²)

9.3.2 Barrel Plating

Cadmium (as metal)
Total cyanide (as Sodium cyanide)
Free Sodium hydroxide
Carbonate (as Sodium carbonate)
Temperature
Current density (approximately)

20-30 g/l
90-110 g/l
10-25 g/l
100 g/l maximum
15-35°C
0.5 Amps/dm² (5 Amps/ft²)

9.4 Passivation solution

Sodium dichromate dihydrate
Sulphuric acid
Temperature

136-182 g/l
9-17 g/l
Room temperature

9.5 Dichromate Dip Solution

Sodium dichromate
Temperature

50-65 g/l
Not less than 60°C

10. SEQUENCE OF OPERATIONS

10.1 Table 1 – Sequence of Operations

Material	Specified maximum tensile strength	Corrosion Resistant Steels												Copper Alloys											
		Below 1101MPa						Above 1100MPa						Below 1101MPa						Above 1100MPa					
Operations	Stress relieve if required to WHPS 006	Masked	Unmasked	Masked	Unmasked	Masked	Unmasked	Masked	Unmasked	Masked	Unmasked	Masked	Unmasked	Masked	Unmasked	Masked	Unmasked	Masked	Unmasked	Masked	Unmasked	Masked	Unmasked	Masked	Unmasked
		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Vapour degrease to WHPS 256 method 1	Mask if required	2	2	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Vac-blank to WHPS 256 method 3B	3	3	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Alkaline clean to WHPS 256 method 2	Rinse in clean cold running water	4	4	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	Nickel strike to WHPS 256 method 11	5	5	6	6	6	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Rinse in clean cold running water	Masked	6	6	7	7	7	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	Unmasked	7	7	8	8	8	8	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Cadmium plate to required thickness (see part 7.2 and Tables 2-4)	Masked	6	6	7	7	7	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	Unmasked	7	7	8	8	8	8	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Rinse in clean cold running water	Masked	7	7	8	8	8	8	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	Unmasked	8	8	9	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Rinse in clean warm water (50°C max)	Masked	8	8	9	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	Unmasked	9	9	10	10	10	10	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Dry	Masked	9	9	10	10	10	10	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
	Unmasked	10	10	11	11	11	11	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Remove marking	Masked	10	10	11	11	11	11	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Unmasked	11	11	12	12	12	12	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Dichromate dip, 15-30 sec. (See Part 9.5) or Pastivate, 2-4 sec (See Part 9.4)	Masked	12	12	13	13	13	13	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	Unmasked	13	13	14	14	14	14	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Rinse in clean cold running water	Masked	13	13	14	14	14	14	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
	Unmasked	14	14	15	15	15	15	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Le-ombrine to WHPS 006	Masked	14	14	15	15	15	15	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
	Unmasked	15	15	16	16	16	16	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Re-activate plated deposit ⁽¹⁾	Masked	15	15	16	16	16	16	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
	Unmasked	16	16	17	17	17	17	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
Pastivate, 5-10 sec (See Part 9.4)	Masked	16	16	17	17	17	17	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Unmasked	17	17	18	18	18	18	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Rinse in clean cold running water	Masked	17	17	18	18	18	18	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
	Unmasked	18	18	19	19	19	19	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Rinse in clean warm water (50°C)	Masked	18	18	19	19	19	19	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
	Unmasked	19	19	20	20	20	20	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
Protect to WHPS 158 ⁽¹⁾	Masked	19	19	20	20	20	20	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
	Unmasked	20	20	21	21	21	21	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20

- (1) Optional operation.
- (2) If necessary, reactivate plated deposit by immersing the components either in the cadmium plating solution for up to 10 seconds without the current flowing, or in the UniClean 293 solution detailed in WHPS 256 method 7. Any stains that still remain on the surface of the plated deposit may be removed by light rubbing with a red (preferred) or green Scotchbrite pad. Thoroughly rinse in clean cold running water.
- (3) When other supplementary coatings are required such as phosphating in accordance with WHPS 031 they shall be carried out at this stage.
- (4) Components that require paint or bond priming shall not be oiled at this stage. Paint priming shall be carried out within 48 hours of passivation. Bond priming shall be carried out in accordance with the relevant specification.

11. INSPECTION

11.1 Visual

11.1.1 Visual checks shall be carried out both before and after passivation to ensure that the coating is smooth, uniform and free from blisters. The component shall also be free from arc burning.

11.1.2 The chromate film shall have an iridescent brassy or golden appearance and be free from bare patches. With certain types of cadmium plating the iridescence may not be distinct and there may be a tendency with normal immersion time for a light khaki or greyish khaki film to form. If this colour is adherent it will be acceptable however, khaki coloured films are undesirable and should be avoided. Brown films, indicating over-treatment, are not acceptable.

11.1.3 The film shall be adherent when tested by a light rubbing with white paper such as filter paper. No more than the faintest stain shall be shown on the paper and the film shall show no signs of having been rubbed through.

11.2 Porosity (Corrodible Steels only)

11.2.1 Porosity tests shall be carried out on components prior to thickness determination. Porosity testing shall be carried out by total immersion in 10 ml/l Hydrochloric acid where possible for 5-10 minutes. Evidence of gas bubbles shall be cause for rejection.

11.2.2 Porosity testing of large or complex components may be omitted at the discretion of the WHL Materials Laboratory.

11.2.3 This test is unsuitable for corrosion resisting steel and non-ferrous components.

11.3 Adhesion

11.3.1 Freedom from blistering after de-embrittlement may be taken as an indication of satisfactory adhesion; otherwise, components shall be tested as detailed below.

11.3.2 Ten percent per bath load or barrel load shall be selected. A small area of the plated surface, selected at random shall be rubbed rapidly and firmly with a suitable tool for about 15 seconds and visually inspected. There shall be no indication of the deposit becoming blistered or otherwise detached from the base metal. The pressure applied shall be sufficient to burnish the coating at each stroke, but not to cut into the plated deposit.

11.3.3 A suitable tool for carrying out the adhesion test is a steel rod, approximately 6mm diameter, with a smooth hemispherical end.

11.4 Thickness

11.4.1 Thickness checks shall be made by sampling as follows:

- a) Vat (Bath) Plating - 100% of components shall be inspected.
- b) Barrel Plating - 10% of components shall be inspected. If the number to be inspected is less than 10 then all components shall be inspected.

11.4.2 The thickness of plating shall be as detailed in Para. 7.2 and Tables 2-4 unless otherwise stated on the drawing.

11.4.3 Thickness may be determined by an appropriate method agreed by the WHL Materials Laboratory. For non-destructive measurements, no less than 5 measurements shall be made per component. The values shall be between the maximum and minimum values detailed in Table 2.

11.4.4 Where the weigh-strip-weigh method is used then the minimum average thickness as calculated shall meet the requirements of Table 2.

11.4.5 When using the weigh-strip-weigh method for average thickness determinations, the components shall be immersed in a 300 g/l solution of ammonium nitrate until the cadmium plating has been totally removed. The average thickness shall be determined by using the following:

$$(\text{Loss in weight (grams)} \times 116,000) / \text{Surface area (mm}^2\text{)} = \text{Average thickness (microns)}$$

11.4.6 The thickness on threaded parts shall be determined on an area as near to the threads as possible. The thickness shall meet the requirements of Table 3.

12. SOLUTION CONTROL

12.1 Analysis

12.1.1 All solutions used in the Cadmium plating process shall be controlled in accordance with WHPS 389 and shall be maintained within the following limits.

12.1.2 Vat (Bath) Plating:

Cadmium (as metal)	12-20 g/l
Total Cyanide (as Sodium cyanide)	38-56 g/l
Free Sodium hydroxide	4-10 g/l
Carbonate (as Sodium carbonate)	100 g/l maximum

12.1.3 Barrel Plating:

Cadmium (as metal)	20-30 g/l
Total Cyanide (as Sodium cyanide)	90-110 g/l
Free Sodium hydroxide	10-25 g/l
Carbonate (as Sodium carbonate)	100 g/l maximum

12.1.4 Passivation solution

Sodium dichromate dihydrate	136-182 g/l
Sulphuric acid	9-17 g/l

12.1.5 Dichromate dip

Sodium dichromate dihydrate	50-65 g/l
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12.1.6 Solutions that meet DEF STAN 03-19 shall be controlled within the limits of the DEF STAN.

12.2 Freedom from Mercury

Note ...

If all salts and anodes are certified mercury free and all gauges associated with the process are mercury free then the following tests do not have to be carried out.

12.2.1 At least once per year tests shall be carried out on the coating for freedom from mercury.

12.2.2 If mercury is detected, further investigation shall be carried out to eliminate the source of contamination.

12.2.3 The above tests shall be carried out using methods approved by the WHL Materials Laboratory, or those specified in DEF STAN 03-19.

12.3 Corrosion Resistance

12.3.1 Routine corrosion tests shall be carried out on a monthly basis.

12.3.2 For Vat Plating two test specimens shall be 125mm x 100mm x 1mm in AMS 6345 and plated to 10-13µm. For Barrel Plating two components from a load shall be selected.

12.3.3 All test specimens shall be chromate passivated in accordance with Para. 9.4.

12.3.4 The specimens shall be exposed to a continuous salt spray test in accordance with BS 7479 or ASTM B-117 for 336 hours. The angle of inclination shall be 20°.

12.3.5 The specimens shall be examined after 96 hours and shall show no signs of white corrosion product. At the end of the exposure period there shall be no evidence of corrosion of the base material (red corrosion products).

12.3.6 If, at the end of the exposure period, corrosion of the base material has occurred the process shall be stopped and no more parts shall be processed in the Vat or Barrel. Two further test specimens shall be submitted to the controlling Laboratory for salt spray testing for 500 hours. The process shall not be used until specimens have successfully passed this test.

12.4 Hull Cells

12.4.1 Hull cell analysis may be carried out on Cadmium Plating solutions when considered necessary as a troubleshooting tool.

13. QUALIFICATION PROCEDURE

13.1 Prior to a new Cadmium Plating facility being approved or when making significant changes to the current process the following qualification tests shall be carried out.

13.2 Two test pieces 100mm x 25mm x 1mm in AMS 6345 material shall be plated to

a thickness of 10-20µm and shall be submitted to the WHL Materials Laboratory for evaluation of appearance and adhesion.

13.2.1 The appearance shall meet the requirements of Para. 11.1. The test pieces shall be suitably held and repeatedly bent through 180° until fracture of the base material occurs. The test pieces shall show no evidence of flaking or separation between the plating and the base metal. Cracking of the plating at the point of fracture shall not be cause for rejection.

13.3 Two test pieces 125mm x 100mm x 1mm in AMS 6345 shall be plated to a thickness of 10-13µm and submitted to the WHL Materials Laboratory for evaluation of thickness and corrosion resistance.

13.3.1 The thickness of the test pieces shall be 10-13µm when measured by a suitable method determined by the WHL Materials Laboratory. There shall be no evidence of corrosion when tested for 500 hours in accordance with Para. 12.3.

13.4 Two test pieces 100mm x 100mm x 1mm in AMS 6345 plated to a thickness of 10-20µm shall be submitted to the WHL Materials Laboratory for evaluation of porosity.

13.4.1 There shall be no evidence of gas evolution when the panels are tested in accordance with Para. 11.2.

Table 2 – Thickness, Normal Requirements.

Materials	Local Thickness		Average Thickness
	Minimum (µm)	Maximum (µm)	Minimum (µm)
a) Steel, Carbon and Low Alloy	10	20	15
b) Steel, Corrosion Resisting, Copper Based Alloys	8	18	15

Table 3 – Thickness, Threaded Components.

Screws, Bolts and Nuts of Nominal Diameter	Minimum (µm)	Maximum (µm)	Average Thickness	
			Local Thickness	Minimum (µm)
Up to and including 3mm	4	6	5	5
Over 3mm and up to 5mm	5	8	6	6
Over 5mm and up to 13mm	6	11	8	8
Over 13mm and up to 20mm	8	12	10	10
e) Over 20mm	15	20	18	18

Table 4 - Thickness, Washers

Local Thickness		8	
Average Thickness		Minimum (µm)	Maximum (µm)
		10	
		Minimum (µm)	Maximum (µm)
		9	

BOEING - MESA SUPPLEMENT

The following additional/alternative requirements shall be implemented when this Westland Helicopter Specification is being used as an equivalent to the Boeing-Mesa process specification detailed below, on the UK Apache Contract.

WHPS 257 and this Supplement meet or exceed the requirements of HP 4-1, HP 4-15 and the associated documents to the extent specified therein.

1. Para. 7.1.1 amended to read:

7.1.1 In accordance with the criteria set out in Table 1, components shall be stress relieved to WHPS 063 plus the Boeing-Mesa supplement prior to cleaning and plating and de-embrittled to WHPS 006 plus Boeing-Mesa supplement post plating.

2. Para. 7.2.1 amended to read:

7.2.1 The thickness requirements shall be in accordance with Table 5.

3. New Para. 11.1.4 added:

11.1.4 The sampling for visual examination and non-destructive testing shall be in accordance with Table 6.

4. Para. 11.3 amended to read:

11.3 The adhesion shall be determined by one of the following methods:

11.3.1 Plated Parts

Tape adhesion testing shall be performed on the parts by applying 25 mm wide 3M's No. 250 Masking tape pressed in place with firm finger pressure. Remove the tape in one quick motion at 90° to the surface and examine for damage or any adhesion failures between the cadmium and the surface. Any failures shall be cause for rejection.

11.3.2 Test Coupons

11.3.2.1 The adhesion shall be assessed on test coupons 25mm x 100mm x 1mm thick AMS 6345 plated in the bath at the same time as the parts. The test coupons shall be tested for adhesion by either cutting through the coating using a sharp knife down to the base metal or by clamping the specimen in a vice and bending it back and forth until rupture occurs.

11.3.2.2 The specimens shall be examined using x4 magnification and shall show no evidence of separation between the plating and the base metal or under plating.

5. New Para. 11.5 added:

11.5 When processing parts of 1250 MPa Maximum Tensile Strength or above, the embrittlement relief shall be monitored by monthly notched sustained load testing. The specimens shall be manufactured from MIL-S-5000 heat treated to 1800 to 1930 MPa with dimensions detailed in WA-TM-1060A with the exception that the root radius of the notch shall be 0.25 ± 0.0125 mm. The specimens shall be subjected to a sustained tensile load equal to 75% of the ultimate tensile strength of the material for a duration of 200 hours and then examined for cracks. The lot shall be rejected if any coated specimen develops cracks.

6. New Para. 11.6 added:

11.6 Lot

A Lot shall be defined as parts of the same material composition, prepared and treated to the same conditions, approximately the same size and shape and processed within an eight hour period.

7. Table 1 heading and first row amended to read:

Materials	Corrosible Steels	Corrosion Resistant Steels	Copper Alloys	Specified MPa	Tensile (Below 1031 MPa for stress relief)	Strength (Above 1030 MPa for stress relief)	Operation	Stress Relieve	WHPs 063 + MDHS	Supplement
				Below 1101	Below 1101	Above 1100	Masked	Masked	1	
				MPa	MPa	MPa	Unmasked	Unmasked	1	
				(Above 1030 MPa for stress relief)	(Below 1031 MPa for stress relief)	(Above 1030 MPa for stress relief)	Masked	Masked		
							Unmasked	Unmasked		
							Masked	Masked		
							Unmasked	Unmasked		
							Masked	Masked		
							Unmasked	Unmasked		
							Masked	Masked		
							Unmasked	Unmasked		

8. New Table 5 added:

TABLE 5

THICKNESS - NORMAL REQUIREMENTS

Class 1	12.5 μ m (0.0005")	20 μ m (0.0008")	7.5 μ m (0.0003")	5 μ m (0.0002")	7.5 μ m (0.0003")
Class 2	12.5 μ m (0.0005")	20 μ m (0.0008")	7.5 μ m (0.0003")	5 μ m (0.0002")	7.5 μ m (0.0003")
Class 3	12.5 μ m (0.0005")	20 μ m (0.0008")	7.5 μ m (0.0003")	5 μ m (0.0002")	7.5 μ m (0.0003")
MINIMUM THICKNESS					
MAXIMUM THICKNESS					

9. New Table 6 added:

TABLE 6

SAMPLING FOR VISUAL EXAMINATION AND NON-DESTRUCTIVE TESTING

Number of Items in Lot Inspected	Number of Items in Samples (Randomly Selected)	Acceptable Number of (Maximum Number of Items Nonconforming to Any Test)
15 or less	7 *	0
16 to 40	10	0
41 to 110	15	0
111 to 300	25	1
301 to 500	35	1
501 and over	50	2

* If the number of items in the inspection Lot is less than 7, the number of items in the sample shall equal this number.

AGUSTA SUPPLEMENT

The following additional/alternative requirements shall be implemented when Westland Helicopter Limited is acting as a sub-contractor to Agusta SpA.

WHPs 257 and this Supplement meet or exceed the requirements of STA 100-80-06 and associated documents to the extent specified therein.

The requirements of STA 100-80-06 shall take precedence in any conflict of interpretation.

1. Para. 7.1.1 amended to read:

7.1.1 When required the pre and post plating baking of steel below 1250 MPa shall be carried out in accordance with WHPs 006. Steels with specified maximum tensile strength of 1250 MPa or above shall be stress relieved and de-embrittled in accordance with Table 7.

2. Para. 7.2.1 amended to read:

7.2.1 The thickness requirements shall be in accordance with Table 8.

3. New Para. 12.5 added:

12.5 When processing parts of 1250 MPa Maximum Tensile Strength or above, the embrittlement relief shall be monitored by monthly notched sustained load testing as follows:

12.5.1 The specimens shall be manufactured from MIL-S-5000 heat treated to 1800 to 1930 MPa with the specimens cut transverse to the grain flow. The specimens shall be machined to the dimensions detailed in WA-TH1060A with the exception that the root radius of the notch shall be 0.25 ± 0.0125 mm.

12.5.2 The cadmium coating thickness on the specimens shall be maintained between 8 to 13 μ m.

12.5.3 The delay time between removal from the plating solution and carrying out the de-embrittlement shall be maintained at 4 hours plus or minus 15 minutes.

12.5.4 The specimens shall be subjected to a sustained tensile load equal to 75% of the ultimate tensile strength of the material for duration of 200 hours without failure.

4. Line 15 of Table 1 amended to read:

Material	Specified maximum tensile strength	Operations	De-embrittle - WHPs 006 and Table 7
Corrosible Steels	Below 1101MPa	Masked	Masked
	Above 1100MPa	Masked	Masked
Corrosion Resistant Steels	Below 1101MPa	Masked	Masked
	Above 1100MPa	Masked	Masked
Copper Alloys		Masked	Masked

5. New Table 7 added:

Condition of Part See Note 1	Oven Temperature	Time in Oven See Note 4	Max Temperature Allowed
All low alloy steel (except carburised), with an ultimate tensile strength of 1245/1 520MPa (hardness Rc40 to 45.5)	196°C	Minimum 23 hours	232°C.
All precipitation hardened stainless steels with an ultimate tensile strength of 1245/1 520MPa (hardness Rc42 to 48)	196°C	Minimum 23 hours	232°C
All spring steels see Note 2	196°C	Minimum 23 hours	232°C

TABLE 7

- The parts shall be subject to stress relief and de-embrittlement in accordance with the materials highest specified ultimate tensile strength limit.
- Cadmium plated springs shall not be flexed before de-embrittlement.
- Nitrided parts cadmium plated on the hardened areas shall be subject to de-embrittlement for 24 hours minimum.
- The de-embrittlement operation shall be carried out within 4 hours of the parts being removed from the plating solution.
- All other parts shall be stress relieved and de-embrittled to WHPS 006.

6. New Table 8 added:

MINIMUM THICKNESS	MAXIMUM THICKNESS
Class 1 12.5 µm (0.0005")	20 µm (0.0008")
Class 2 7.5 µm (0.0003")	12.5 µm (0.0005")
Class 3 5 µm (0.0002")	7.5 µm (0.0003")

THICKNESS - NORMAL REQUIREMENTS

TABLE 8

Appendix II

Wessex Water

WATER INDUSTRY ACT 1991

CONSENT TO THE DISCHARGE OF

TRADE EFFLUENT

TO:

Reid Plating Ltd
C/O South West Metal Finishing Ltd
Alphin Brook Road
Marsh Barton
Exeter EX2 8TJ

WHEREAS:

- I Reid Plating Ltd discharge from premises at 9A Linbur Road, Linton Trading Estate, Yeovil, BA22 8JX under a consent dated 11 March 1985 in respect of which a Trade Effluent Notice dated 31 January 1985 was served by G A Reid, and it has been agreed that such a consent shall be replaced with this new consent.
- II Wessex Water Services Ltd (hereinafter referred to as the "Company") hereby give such new consent but subject to the conditions hereinafter set forth and to be observed by you.
- III In pursuance of the provisions of the Water Industry Act 1991, the discharge of trade effluent in accordance with the said trade effluent notice would not be lawful without the consent of the Company.
- IV Any connection of your drain to the public sewer necessitated by this consent shall be made at your own expense and to the satisfaction of the Company.

NOW THEREFORE WE HEREBY GIVE YOU NOTICE that the Company's consent to the discharge of trade effluent from the above mentioned premises is subject to the following condition and not otherwise:-

- 1 The public sewer into which the trade effluent may be discharged is the foul sewer situate at see attached plan.
- 2 If required by the Company, drains, sampling and testing points shall be provided through which trade effluent and nothing else shall pass.
- 3 No change shall be made in the point or points at or through which the trade effluent is to be discharged to the public sewer except with the consent in writing of the Company.
- 4 Apart from the substances specified in this consent, the trade effluent shall not include any substances of a nature, composition or quantity likely, either alone or in combination with the contents of the sewer, to:-
 - (a) injure the public sewer into which it is discharged or by which it is conveyed, or
 - (b) interfere with the free flow of the contents of the public sewer aforesaid, or
 - (c) injure the sewerage treatment works or any machinery or equipment installed thereat, or
 - (d) interfere with any processes of purification of sewage or trade effluent, or

Matters to be considered prior to discharge to the sewer

Payment	14	(a) Subject to Section 121(4) of the Water Industry Act 1991 or any amendments, variations or modification thereof, the occupier of the said premises shall pay to the Company such charges as determined by the charging rates as may be prescribed within a scheme of charges made annually pursuant to Section 143 of the Water Industry Act 1991.
Failure of recording apparatus	15	(b) A Schedule of charging rates including the methods by which, and the principles on which the charges are made, may be inspected during normal business hours at the Office of the Company as designated in Paragraph 12 below or at the Registered Office of the Company, namely Wessex House, Wessex Street, Bristol. (c) All payments arising from the charges as levied by the company in respect of such Trade Effluent consents shall be paid on demand. (d) All sums due in respect of charges should be remitted (unless otherwise stated by the Company) to Customer Accounts Centre, 1 Clevedon Walk, Nailsea, Bristol, BS19 2QR. (e) The granting of time or any indulgence of any nature by the Company shall not affect or invalidate the right of Wessex Water or affect, reduce or mitigate the liability of the Occupier.
Charging Information	16	If any notch gauge or recorder or other apparatus installed for the purpose of complying with conditions imposed by this consent ceases to measure or record or is suspected of not measuring or recording correctly, the quantity of trade effluent discharged on each day into the public sewer during the period from the date on which the records of the volume of trade effluent discharged into the public sewer were last accepted by the Company as being correct, up to the date when the gauge or recorder or other apparatus again registers correctly, shall be deemed for the purpose of any payment to be made to the Company to be the same quantity as the average daily volume of trade effluent discharged during the period of one month preceding the date on which the said records were last accepted as aforesaid, or during the period of one month immediately after the gauge or recorder or other apparatus has been correct, whichever is the greater. All information, figures and records, including those relating to water consumption, required by the Company for the assessing of their charge for reception, conveyance and disposal of the effluent must be given on request.

Dated this fourth day of March 1996

For and on behalf of Wessex Water Services Ltd

Mervyn Brown
Divisional Manager
Wessex Water Services

(e)	cause a nuisance or give off a vapour or harmful substance, or affect prejudicially the quality of the watercourse receiving the purified sewage effluent.	Condensing water
5	If required by the Company condensing and cooling water shall be eliminated from the effluent.	Changes in composition and discharge
6	THE COMPANY SHALL BE NOTIFIED FORTHWITH IN WRITING OF ANY CHANGES IN CONDITIONS AND OR PROCESSES WHICH ARE LIKELY TO ALTER THE NATURE OR COMPOSITION OF THE EFFLUENT AND ALSO THE PERMANENT CESSATION OF THE DISCHARGE IN WHICH LATTER CASE THIS CONSENT BECOMES VOID.	Nature or composition
7	The trade effluent to be discharged under this consent shall consist of waste water specified in the said trade effluent notice and derived from electrophoresis.	pH Value
8	The pH of the trade effluent to be discharged under this consent shall not be less than pH 6.0 or greater than pH 10.5.	Temperature
9	The temperature of the trade effluent to be discharged under this consent shall not exceed 43.3°C (110°F).	Conditions of acceptance
10	The effluent shall not contain the substances listed in the Appendix in proportions greater than those stated.	Maximum amount to be discharged to any day
11	The maximum quantity of trade effluent which may be discharged into the public sewer on any one day of 24 hours shall not exceed 25 cubic metres (m ³).	Maximum rate of discharge
12	The rate of discharge of trade effluent to the public sewer shall not exceed 3.0 litres per second (l/s).	Inspection Chamber
13	You shall, if required by the Company at your own expense:-	Measurement and determination of discharge
(a)	provide and maintain suitable inspection chambers or manholes in a position and of a type to be approved by the Company in connection with each pipe or channel through which the trade effluent is discharged into the public sewer so as to enable a person readily to take at any time a sample of the trade effluent passing into the public sewer.	
(b)	provide and maintain in connection with every such pipe or channel either a notch gauge and continuous recorder or some other meter or other apparatus of a type approved by the Company suitable and adequate for measuring and automatically recording the volume and rate of discharge of the trade effluent discharged into the public sewers, and for the testing of such apparatus.	
(c)	provide and maintain apparatus to be approved by the Company for determining the nature and composition of the trade effluent being discharged from the premises into the public sewer, and for testing of such apparatus.	
(d)	provide and maintain suitable and adequate treatment plant for the trade effluent if it is shown to be necessary.	
(e)	keep to the satisfaction of the Company records of the volume, rate of discharge, nature and composition of any trade effluent discharged and records of readings of meters and other apparatus provided in compliance with the conditions of this consent.	

Payment

14

(a) Subject to Section 121(4) of the Water Industry Act 1991 or any amendments, variations or modification thereof, the occupier of the said premises shall pay to the Company such charges as determined by the charging rates as may be prescribed within a scheme of charges made annually pursuant to Section 143 of the Water Industry Act 1991.

(b) A Schedule of charging rates including the methods by which, and the principles on which the charges are made, may be inspected during normal business hours at the Office of the Company as designated in paragraph 12 below or at the Registered Office of the Company, namely Messes House, Passage Street, Bristol.

(c) All payments arising from the charges as levied by the company in respect of such Trade Effluent consents shall be paid on demand.

(d) All sums due in respect of charges should be remitted (unless otherwise stated by the Company) to Customer Accounts Centre, 1 Cleveland Walk, Nailsea, Bristol, BS19 2QR.

(e) The granting of time or any indulgence of any nature by the Company shall not affect or invalidate the rights of Wessex Water or affect, reduce or mitigate the liability of the Occupier.

Failure of recording apparatus

15

If any notch gauge or recorder or other apparatus installed for the purpose of complying with conditions imposed by this consent ceases to measure or record or is suspected of not measuring or recording correctly, the quantity of trade effluent discharged on each day into the public sewer during the period from the date on which the records of the volume of trade effluent discharged into the public sewer were last accepted by the Company as being correct, up to the date when the gauge or recorder or other apparatus again registers correctly, shall be deemed for the purpose of any payment to be made to the Company to be the same quantity as the average daily volume of trade effluent discharged during the period of one month preceding the date on which the said records were last accepted as aforesaid, or during the period of one month immediately after the gauge or recorder or other apparatus has been correct, whichever is the greater.

All information, figures and records, including those relating to water consumption, required by the Company for the assessing of their charge for reception, conveyance and disposal of the effluent must be given on request.

Changing Information

16

Dated this fourth day of June 1992

For and on behalf of Wessex Water Services Ltd

Michael Brown
Divisional Manager
Wessex Water Services

CONSIST APPENDIX 1

The effluent shall not at any time include the following substances:

- a Volatile petroleum products producing an inflammable vapour at a temperature of less than seventy three degrees Fahrenheit when tested in accordance with the Petroleum (Consolidation) Act 1928.
- b Chlorinated hydrocarbons and related compounds
- c Calcium carbide

CONSIST APPENDIX 2

- 1 Synthetic detergents - to be at least 90% biodegradable within the local treatment process
- 2 Sulphides - expressed as S shall not exceed 10mg/l of effluent
- 3 Suspended solids - shall not exceed 1000 mg/l of effluent
- 4 Cyanide - expressed as CN shall not on acidification exceed 5mg/l of effluent
- 5 The metals listed below shall not exceed the concentration stated in milligrams per litre (mg/l) of effluent or soluble or insoluble salts or compounds, expressed as the metal:

- a) Zinc (Zn) - shall not exceed 5 mg/l of effluent
- b) Copper (Cu) - shall not exceed 3 mg/l of effluent
- c) Nickel (Ni) - shall not exceed 3 mg/l of effluent
- d) Chromium (Cr) - shall not exceed 5 mg/l of effluent

CONSIST APPENDIX 3

The effluent shall not contain materials which may be retained by a screen having perforations of 6.0 mm in diameter.

To Public Sewer in Boundary Road

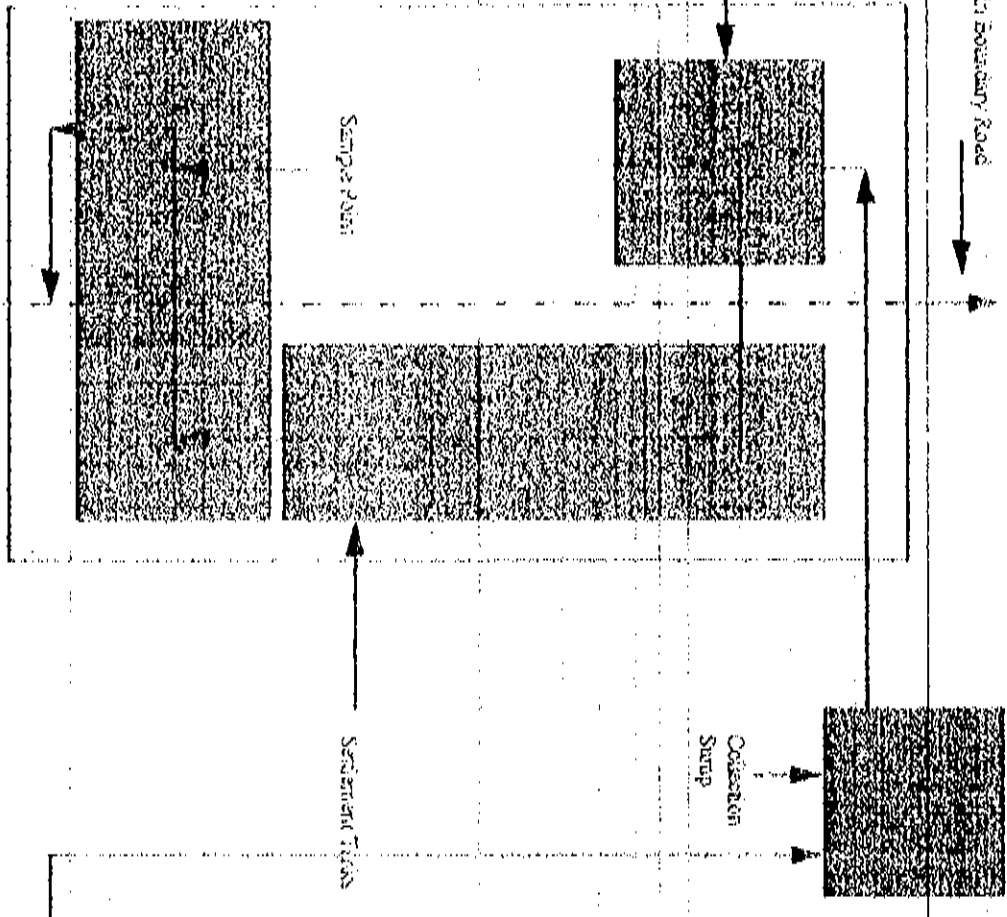
Sediment
Tower

Sediment
Point

Collection
Sump

Sediment
Tanks

Reid Plating Ltd



SE2000 Model Plating Plant

Plating Area/Flight Bar	0.32	m2/Bar
-------------------------	------	--------

4.5	Bar/Inch
-----	----------

1.44	m ² /h
------	-------------------

0.15	liters/m ²
------	-----------------------

0.22
litre/h

if actual drag-out rate is not known, set coefficient to one of the typical values in the options shown below

SUMMARY

SE2000 Model Plating Plant

RINSE 4 - AFTER PASSIVATE

Operating hours per year*

Drag out

No of tanks

Rinse ratio required

OWN PLANT

1920 h/year
0.216 litre/h

2

20000

Adjust to set parameters of own plant

MODIFIED PLANT

1920 h/year
0.216 litre/h

4

20000

Press to return to Summary page

SUMMARY

Adjust to set parameters of improved plant

Water consumption
Cost of water IN*

Cost of trade effluent discharge*

Total annual running costs

Capital cost of additional tank(s)*

Interest rate*

Payback period

*rates and costs can be modified on the "Standards" or "Drag Out" pages

Annual savings (including Eco Rinse saving of water & effluent)

30.5 litre/h	£ 41 £ pa	£ 65 £ pa
2.6 litre/h	£ 3 £ pa	£ 5 £ pa
	£ 2 £ pa	
	£ 59 £ pa	

£ 1 942
7 %
#NUM! years