STATE OF ARKANSAS
DEPARTMENT OF POLLUTION CONTROL AND ECOLOGY
8001 NATIONAL DRIVE, P.O. BOX 8913
LITTLE ROCK, ARKANSAS 72219-8913
PHONE: (501) 562-6533
FAX: (501) 562-2541

17902

June 5, 1992

Mr. Paul Maples
Vickers, Inc.
400 Lincoln Ave
Searcy, AR 72143

CSN 60-0438, Permit NO. 163-S

Dear Mr. Maples:

This letter is to acknowledge receipt of your waste disposal request of May 26, 1992. Since the Department has confirmed that the waste is non-hazardous as represented by the submitted data we can authorize its disposal in the Brushy Island sanitary landfill contingent upon the following conditions:

1. The waste must not be a liquid or show any free flowing characteristics. It must be a minimum of 30% solids and capable of supporting the daily and final cover at the landfill.

2. The waste must be handled according to the provisions of the Solid Waste Code and the landfills permit.

This authorization is based on the information supplied to the Department. It does not relieve the generator or disposal site of any liability for incorrectly classified waste, nor for any environmental damage it might cause. It is incumbent upon the generator, hauler and landfill permittee to ensure that all State and Federal regulations be strictly adhered to.

This authorization shall not be construed by the permittee or generator as permanent. Any change in the generators process that may affect waste characteristics, waste volumes, or regulatory or policy revisions may be grounds for denial of landfill disposal requests. If you have any questions feel to contact me.

Sincerely,

Harry Elliott
Enforcement Coordinator
Solid Waste Division

cc: Dennis Green, Hazardous Waste Division

STATE OF ARKANSAS
DEPARTMENT OF POLLUTION CONTROL AND ECOLOGY
8001 NATIONAL DRIVE, P.O. BOX 8913
LITTLE ROCK, ARKANSAS 72209-8913

Industrial / Special Waste Disposal Request

Company Name	Street Address	Mailing Address
VICKERS, INC	400 Lincoln Ave SEARCY, AR 72143	SAME
Former name (if applicable)	County	Telephone Number
NA	White	501-268-5854

Requests authorization to dispose a industrial / special solid waste as described below (a separate forms must be completed for each waste stream):

A. Common name of the waste: ENSTRIP BATCH TREATMENT SLUDGE

B. Is this a new or existing waste stream? ☐ New waste stream ☑ Existing waste stream

C. Describe the process that generates the waste (attach sheet if necessary):

SEE ATTACHED

D. What is the physical state of the waste? ☐ Solid ☐ Liquid ☑ Sludge

E. Moisture content: 36.8 % solids

F. Disposal Frequency and Amount: ☐ One time disposal ☑ Ongoing disposal

Amount disposed each time >1 ☑ Cu. Yd. ☐ Tons ☐ Lbs

If waste disposal is an ongoing activity, how often is it disposed--daily, weekly, monthly, quarterly? YEARLY

G. What Solid Waste Management Facility (landfill) is proposed to accept the waste?

Name of Facility: BRUSHY ISLAND LANDFILL Permit No.: 0163SR-0

Location: Jacksonville, AR

H. Justification for a non-hazardous classification (attach supporting documentation):

NOTE: If analytical data is used for justification, a description of the sampling procedure and the laboratory *Quality Assurance / Quality Control Data* must also be be submitted:

RANDOM SAMPLING FROM SLUDGE PRESS OUTPUT

I hereby certify that I have examined the information contained herein and such information is accurate and complete. Further, I certify that the waste described in this Request is not a "Listed Waste" as described at 40 CFR 261.31-261.33, a "Characteristic Waste" as described at 40 CFR 261.21-261.24, or otherwise defined as a Hazardous Waste by the Arkansas Hazardous Waste Management Act and Code. I understand that there are significant criminal penalties for purposely or knowingly making false statements, representations or certifications, in accordance with Act 1057 of 1991.

Signature	Printed Name	Position (Title)	Date
Paul Maples	PAUL MAPLES	MANAGER, PLANT ENGR & MTCE	5/26/92

Return Form To:
Hazardous Waste Division
Arkansas Department of Pollution Control and Ecology
P.O. Box 8913
Little Rock AR 72219-8913

Dated July 1991

OFFICIAL USE ONLY	HWD	SWD	FILE NO.
			CSN: 60-0435
			Permit#: 1653

ENSTRIP PROCESS DESCRIPTION:

The Enstrip processing bath is used to salvage rejected parts that have already been through the Electroless Nickel plating process but have failed to meet quality standards. The parts are immersed in the bath for 8-10 hours which removes the Nickel plating without attacking the parent metal. The salvaged parts can then be re-processed through the plating process.

The Enstrip bath consists of 75 pounds of Metex Nickel Stripper SCB-A, 75 gallons of Metex Nickel Stripper SCB-B (see attached MSDS), 20 pounds of Caustic Soda and the remainder is water. The entire bath will equal 150 gallons.

After a period of time, usually 3 months of operation, the chemical make-up of the bath becomes unbalanced and begins to attack the parent metal of the part in addition to the Nickel plating rendering the part useless. At this time, the process tank is emptied into drums and a new bath is formulated.

ENSTRIP BATCH TREATMENT PROCESS:

One drum (55 gallons) of the spent Enstrip bath is diluted with 3 parts (150 gallons) water within a batch treatment tank. This mixture is agitated while slowly injecting sulfuric acid to lower the PH. When a PH level of 6 is obtained, 15 gallons of DTC (see attached MSDS) and 3 pounds of Calcium Chloride (see attached MSDS) are added to the mixture. These chemicals are allowed to react for 1 hour, then the entire contents of the tank are forced through a filter frame sludge press. Any free liquids from the press are further processed through waste water treatment. The sludge from the press is what we asking you to take under consideration.

MATERIAL SAFETY DATA SHEET

) 8/25/88 CODE 13711

SECTION I

Manufacture's Name MacDermid Incorporated	EMERGENCY TELEPHONE 203-575-5700
ADDRESS (Number, Street, City, State, Zip Code) 526 Huntingdon Avenue Waterbury, CT. 06708	MFSA EMERGENCY 24 HOUR HOTLINE: (313) - 644 - 5626
CFR-49 - DOT Proper Shipping Name Corrosive Liquid NOS, (Ethylenediamine/Ammonium Hydroxide) Corrosive Material UN1760	
CHEMICAL NAME AND SYNONYMS N/A	TRADE NAME AND SYNOMYMS Metex Nickel Stripper
CHEMICAL FAMILY Amine	FORMULA SCB B Mixture

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVE & SOLVENTS	%	TLV (UNITS)	ALLOYS & METALLIC COATINGS	%	TLV (UNITS)
	N/A			N/A	
PIGMENTS	"		BASE METAL	"	
CATALYST	"		ALLOYS	"	
VEHICLE	"		METALLIC COATINGS	"	
SOLVENTS	"		FILLER METAL PLUS OR CORE FLUX	"	
ADDITIVES	"		OTHERS	"	
OTHERS	"				

HAZARDOUS MIXTURES OR OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (UNITS)
Ethylenediamine (107-15-3)	10-25	10 ppm
Ammonium Hydroxide (1366-21-6) PEL: 50 ppm*	2	25 ppm*
*as ammonia		

SECTION III - PHYSICAL DATA

BOILING POINT (F)	> 212	SPECIFIC GRAVITY (H_2O = 1)	0.99
VAPOR PRESSURE (MM. HG.)	< 10	PERCENT VOLATILE BY VOLUME (%)	~ 2
VAPOR DENSITY (AIR = 1)	> 1	EVAPORATION RATE (= 1) Ethyl Ether	< 1
SOLUBILITY IN WATER	Complete	pH	> 12

APPEARANCE AND ODOR
Clear, colorless liquid - Ammonia odor

SECTION IV = FIRE AND EXPLOSION HAZARD DATA

		LEL	UEL
FLASH POINT (METHOD USED) Non-Flammable	FLAMMABLE LIMITS N/A		
EXTINGUISHING MEDIA Compatible with waterspray, CO_2, dry chemical, foam, Halon			
SPECIAL FIRE FIGHTING PROCEDURES Wear self contained breathing apparatus, full protective clothing.			
UNUSUAL FIRE AND EXPLOSION HAZARDS Will emit ammonia gas and oxides of nitrogen and sulfur when heated.			

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

Not established for product. See Section II.

EFFECTS OF OVEREXPOSURE-UNLESS OTHERWISE STATED, CHRONIC OR LONG-TERM HEALTH EFFECTS UNKNOWN!

May cause irritation or burns to eyes, skin, mucous membranes. Inhalation of ammonia vapors may cause headache, nausea, vomiting. Prolonged exposure may cause severe irritation of the respiratory tract with coughing, bronchospasm, edema, respiratory arrest. Bronchitis or pneumonia may follow severe exposure.

EMERGENCY AND FIRST AID PROCEDURES

EYES: Flush with water for 15 minutes. Contact physician
SKIN: Wash with water.
INGESTION: Give water, do not induce vomiting. Contact physician at once!
INHALATION: Remove to fresh air.

SECTION VI - REACTIVITY DATA

UNSTABLE		CONDITIONS TO AVOID
STABLE	X	N/A

INCOMPATIBILITY (MATERIALS TO AVOID)

Strong Acids

HAZARDOUS DECOMPOSITION PRODUCTS

Ammonia, oxides of nitrogen/sulfur

HAZARDOUS POLYMERIZATION		CONDITIONS TO AVOID
MAY OCCUR		N/A
WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Wear protective clothing. Never discharge directly into sewers or waterways. Ventilate area. Flush with water to chemical drain.

WASTE DISPOSAL METHOD

Always check and comply with government disposal regulations. Neutralize to pH 6 to 8 and discard.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (SPECIFY TYPE)

NIOSH-approved respirator rated for ammonia vapors

VENTILATION	LOCAL EXHAUST	SPECIAL
	X	N/A
	MECHANICAL (GENERAL)	OTHER
	N/A	N/A

PROTECTIVE GLOVES	EYE PROTECTION
Rubber	Face Shield

OTHER PROTECTIVE EQUIPMENT

Rubber apron/boots

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Keep in tightly closed containers in a cool storage location

OTHER PRECAUTIONS

Avoid eye contact. Always wash clothing before re-use. Wash thoroughly after handling.

PREPARED BY: MacDermid Incorporated DATE: 8/25/88

13711

MATERIAL SAFETY DATA SHEET

R 08/18/89 CODE 13705

SECTION I

Manufacture's Name MacDermid Incorporated	EMERGENCY TELEPHONE 203-575-5700
ADDRESS (Number, Street, City, State, Zip Code) 526 Huntingdon Avenue Waterbury, CT. 06708	MFSA EMERGENCY 24 HOUR HOTLINE: (313) - 644 - 5626
CFR-49 - DOT Proper Shipping Name Non-Regulated	
CHEMICAL NAME AND SYNONYMS N/A	TRADE NAME AND SYNONYMS Metex Nickel Stripper
CHEMICAL FAMILY Organic Salt	FORMULA SCB-A Mixture

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVE & SOLVENTS	%	TLV (UNITS)	ALLOYS & METALLIC COATINGS	%	TLV (UNITS)
	N/A			N/A	
PIGMENTS	"		BASE METAL	"	
CATALYST	"		ALLOYS	"	
VEHICLE	"		METALLIC COATINGS	"	
SOLVENTS	"		FILLER METAL PLUS OR CORE FLUX	"	
ADDITIVES	"		OTHERS	"	
OTHERS	"				

HAZARDOUS MIXTURES OR OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (UNITS)
Salt of nitro aryl sulfonic acid (127-68-4)	90-98	Not listed

SECTION III - PHYSICAL DATA

BOILING POINT (F)	N/A	SPECIFIC GRAVITY (H_2O = 1)	N/A
VAPOR PRESSURE (MM. HG.)	0	PERCENT VOLATILE BY VOLUME (%)	0
VAPOR DENSITY (AIR = 1)	N/A	EVAPORATION RATE (= 1)	N/A
SOLUBILITY IN WATER	Appreciable		

APPEARANCE AND ODOR
Pale yellow to tan powder - odorless

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED)	392°F O.C.	FLAMMABLE LIMITS	N/A

	LEL	UEL
EXTINGUISHING MEDIA Waterspray		
SPECIAL FIRE FIGHTING PROCEDURES If material is smoldering, spread burning material out thinly and douse with water. Wear self-contained breathing apparatus.		
UNUSUAL FIRE AND EXPLOSION HAZARDS Material is an oxygen donor and can support combustion.		

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
Not established for product. See Section II.

EFFECTS OF OVEREXPOSURE-UNLESS OTHERWISE STATED, CHRONIC OR LONG-TERM HEALTH EFFECTS UNKN
Possible slight irritation to eyes, skin and mucous membranes.

EMERGENCY AND FIRST AID PROCEDURES
Eyes: Flush with water for 15 minutes. Contact physician.
Skin: Wash with water.
Ingestion: Give water, induce vomiting. Contact physician.
Inhalation: Remove to fresh air.

SECTION VI - REACTIVITY DATA

UNSTABLE	X	**CONDITIONS TO AVOID**
STABLE		Temperatures above 700°F.

INCOMPATIBILITY (MATERIALS TO AVOID)
Sodium hydroxide, oxidizable mixtures

HAZARDOUS DECOMPOSITION PRODUCTS
Oxides of sulfur, carbon and nitrogen, oxygen gas

HAZARDOUS POLYMERIZATION		**CONDITIONS TO AVOID**
MAY OCCUR		N/A
WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Scoop up and collect in plastic container for disposal. Flush remaining material to chemical drain with water.

WASTE DISPOSAL METHOD - ALWAYS CHECK AND COMPLY WITH GOVERNMENT DISPOSAL REGULATIONS.
Dispose of in secure, approved landfill.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (SPECIFY TYPE)
Not normal required.

VENTILATION	**LOCAL EXHAUST** N/A		**SPECIAL** N/A
	MECHANICAL (GENERAL) X		**OTHER** N/A
PROTECTIVE GLOVES Rubber		**EYE PROTECTION** Safety goggles	

OTHER PROTECTIVE EQUIPMENT
Rubber apron/boots

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Store in cool, dry area away from open flame, sparks and other sources of ignition.

OTHER PRECAUTIONS
Wash thoroughly after handling.

PREPARED BY: MacDermid Incorporated **DATE:** 08/18/89

13705

C-55

SHIP TO:

15020401
VICKERS INC
ATTN: P MAPLES, PLANT ENG MGR
400 E LINCOLN

SEARCY AR 72143

ORDER NO: 15050496
PROD NO. 04000797

VAN WATERS & ROGERS INC., SUBSIDIARY OF UNIVAR
1600 NORTON BLDG. SEATTLE, WA 98104-1564 (406) 435-8700

EMERGENCY ASSISTANCE

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL CHEMTREC (800)424-9300

FOR PRODUCT AND SALES INFORMATION

CONTACT YOUR LOCAL VAN WATERS & ROGERS BRANCH OFFICE

PRODUCT IDENTIFICATION

PRODUCT NAME: CALCIUM CHLORIDE 94-97%
COMMON NAMES/SYNONYMS: PELADOW (R)
CALCIUM CHLORIDE

CAS NO.: MIXTURE
VW&R CODE: P1270016

FORMULA: MIXTURE
HAZARD RATING (NFPA 704)
HEALTH: 1
FIRE: 0
REACTIVITY: 0
SPECIAL: NONE

DATE ISSUED: 01/90
SUPERCEDES: 12/89
HAZARD RATING SCALE:
0=MINIMAL 3=SERIOUS
1=SLIGHT 4=SEVERE
2=MODERATE

HAZARDOUS INGREDIENTS

COMPONENT	CAS NO.	%	EXPOSURE LIMITS, MG/M3 OSHA PEL	ACGIH TLV	OTHER LIMIT	HAZARD
CALCIUM CHLORIDE	10043-52-4	94-96	NONE	NONE	NONE	NONE
SODIUM CHLORIDE	7647-14-5	1-2	NONE	NONE	10 (DOW)	NONE
POTASSIUM CHLORIDE	7447-40-7	2-3	NONE	NONE	10 (DOW)	NONE
STRONTIUM CHLORIDE	10476-85-4	1	NONE	NONE	NONE	NONE

(R) TRADEMARK OF THE DOW CHEMICAL COMPANY.

PHYSICAL PROPERTIES

BOILING POINT, DEG F: >1600
MELTING POINT, DEG F: 1,434
SPECIFIC GRAVITY (WATER=1): 2.2
VAPOR PRESSURE, MM HG/20 DEG C: LO.005
VAPOR DENSITY (AIR=1): N/A
WATER SOLUBILITY, %: VERY SOLUBLE

APPEARANCE AND ODOR:
WHITE TO OFF WHITE PELLETS OR FLAKES; ODORLESS
EVAPORATION RATE [illegible]

FIRST AID MEASURES

IF INHALED: REMOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET IMMEDIATE MEDICAL ATTENTION.

IN CASE OF EYE CONTACT: IMMEDIATELY FLUSH EYES WITH LOTS OF RUNNING WATER FOR 15 MINUTES, LIFTING THE UPPER AND LOWER EYELIDS OCCASIONALLY. GET IMMEDIATE MEDICAL ATTENTION.

IN CASE OF SKIN CONTACT: IMMEDIATELY WASH SKIN WITH LOTS OF SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND SHOES; WASH BEFORE REUSE. GET MEDICAL ATTENTION IF IRRITATION PERSISTS AFTER WASHING.

IF SWALLOWED: IF CONSCIOUS, IMMEDIATELY INDUCE VOMITING BY GIVING TWO GLASSES OF WATER AND STICKING A FINGER DOWN THE THROAT. GET IMMEDIATE MEDICAL ATTENTION. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSING PERSON.

HEALTH HAZARD INFORMATION

PRIMARY ROUTES OF EXPOSURE: SKIN OR EYE CONTACT

SIGNS AND SYMPTOMS OF EXPOSURE

INHALATION: BREATHING DUST MAY IRRITATE THE NOSE AND THROAT AND CAUSE COUGHING AND CHEST DISCOMFORT.

EYE CONTACT: DUSTS MAY CAUSE MODERATE TO SEVERE EYE IRRITATION WITH CORNEAL INJURY THAT MAY BE SLOW TO HEAL.

SKIN CONTACT: PROLONGED OR REPEATED CONTACT WITH THE DUST MAY IRRITATE THE SKIN OR CAUSE BURNS ESPECIALLY IF SKIN IS MOIST OR IF MATERIAL IS CONFINED TO SKIN.

SWALLOWED: SWALLOWING SOLIDS MAY CAUSE GASTROINTESTINAL IRRITATION OR ULCERATION.

CHRONIC EFFECTS OF EXPOSURE: NO SPECIFIC INFORMATION AVAILABLE.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NONE KNOWN.

TOXICITY DATA

ORAL: RAT LD50 = 900-2,000 MG/KG

DERMAL: RABBIT LD50 >5.0 G/KG

INHALATION: NOT APPLICABLE

CARCINOGENICITY: THIS MATERIAL IS NOT CONSIDERED TO BE A CARCINOGEN BY THE NATIONAL TOXICOLOGY PROGRAM, THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER, OR THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

OTHER DATA: RESULTS OF IN VITRO MUTAGENICITY TESTS HAVE BEEN NEGATIVE FOR CALCIUM CHLORIDE.

PERSONAL PROTECTION

VENTILATION: LOCAL MECHANICAL EXHAUST VENTILATION CAPABLE OF MINIMIZING DUST EMISSIONS AT THE POINT OF USE.

RESPIRATORY PROTECTION: NIOSH-APPROVED DUST RESPIRATOR OR MASK IN THE ABSENCE OF ADEQUATE ENVIRONMENTAL CONTROLS AT THE POINT OF USE.

EYE PROTECTION: CHEMICAL GOGGLES.

PROTECTIVE CLOTHING: LONG SLEEVED SHIRT, TROUSERS, SAFETY SHOES, RUBBER GLOVES, AND RUBBER APRON.

OTHER PROTECTIVE MEASURES: AN EYEWASH AND SAFETY SHOWER SHOULD BE NEARBY AND READY FOR USE.

FIRE AND EXPLOSION INFORMATION

FLASH POINT, DEG F: N/A
METHOD USED: N/A

FLAMMABLE LIMITS IN AIR, %
LOWER: N/A UPPER: N/A

EXTINGUISHING MEDIA: THIS MATERIAL IS NOT COMBUSTIBLE.

SPECIAL FIRE FIGHTING PROCEDURES: FIRE FIGHTERS SHOULD WEAR SELF CONTAINED BREATHING APPARATUS. USE WATER SPRAY TO COOL NEARBY CONTAINERS AND STRUCTURES EXPOSED TO FIRE.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE.

---HAZARDOUS REACTIVITY---

STABILITY: STABLE POLYMERIZATION: WILL NOT OCCUR
CONDITIONS TO AVOID: DECOMPOSES ABOVE 400 DEG F

MATERIALS TO AVOID: KEEP WATER AND MOIST AIR OUT OF THE CONTAINER. METALS WILL SLOWLY CORRODE IN AQUEOUS CALCIUM CHLORIDE SOLUTIONS. ALUMINUM AND ITS ALLOYS AND YELLOW BRASS WILL BE ATTACKED BY CALCIUM CHLORIDE.

HAZARDOUS DECOMPOSITION PRODUCTS: NONE

---SPILL, LEAK, AND DISPOSAL PROCEDURES---

ACTION TO TAKE FOR SPILLS OR LEAKS: WEAR PROTECTIVE EQUIPMENT INCLUDING RUBBER BOOTS, RUBBER GLOVES, RUBBER APRON, CHEMICAL GOGGLES AND RESPIRATORY PROTECTION. FOR SMALL SPILLS, SWEEP UP AND DISPOSE OF IN DOT-APPROVED WASTE CONTAINERS.
FOR LARGE SPILLS, SHOVEL INTO DOT-APPROVED WASTE CONTAINERS.
COMPLY WITH ALL APPLICABLE GOVERNMENTAL REGULATIONS ON SPILL REPORTING, AND HANDLING AND DISPOSAL OF WASTE.

DISPOSAL METHODS: DISPOSE OF CONTAMINATED PRODUCT AND MATERIALS USED IN CLEANING UP SPILLS OR LEAKS IN A MANNER APPROVED FOR THIS MATERIAL. CONSULT APPROPRIATE FEDERAL, STATE AND LOCAL REGULATORY AGENCIES TO ASCERTAIN PROPER DISPOSAL PROCEDURES.
NOTE: EMPTY CONTAINERS CAN HAVE RESIDUES, GASES AND MISTS AND ARE SUBJECT TO PROPER WASTE DISPOSAL, AS ABOVE.

---SPECIAL PRECAUTIONS---

STORAGE AND HANDLING PRECAUTIONS: STORE IN A COOL,VERY DRY PLACE. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE. WASH THOROUGHLY AFTER HANDLING. DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING.

REPAIR AND MAINTENANCE PRECAUTIONS: NONE.

OTHER PRECAUTIONS: CONTAINERS, EVEN THOSE THAT HAVE BEEN EMPTIED, WILL RETAIN PRODUCT RESIDUE. ALWAYS OBEY HAZARD WARNINGS AND HANDLE EMPTY CONTAINERS AS IF THEY WERE FULL.

ALWAYS USE COOL WATER (TEMP.<80 DEG F/27 DEG C) WHEN DISSOLVING CALCIUM CHLORIDE. HEAT IS EVOLVED DURING DISSOLUTION. WHEN EXPOSED TO THE ATMOSPHERE CALCIUM CHLORIDE WILL PICK UP WATER AND FORM A SOLUTION. CLOTHING AND SHOES WILL BE DAMAGED BY CALCIUM CHLORIDE.

---FOR ADDITIONAL INFORMATION---

CONTACT MSDS COORDINATOR, VAN WATERS & ROGERS INC.
DURING BUSINESS HOURS, PACIFIC TIME (408)435-8700

---NOTICE---

VAN WATERS & ROGERS INC. ("VW&R") EXPRESSLY DISCLAIMS ALL EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE PRODUCT OR INFORMATION PROVIDED HEREIN.

ALL INFORMATION APPEARING HEREIN IS BASED UPON DATA OBTAINED FROM THE MANUFACTURER AND/OR RECOGNIZED TECHNICAL SOURCES. WHILE THE INFORMATION IS BELIEVED TO BE ACCURATE, VW&R MAKES NO REPRESENTATIONS AS TO ITS ACCURACY OR SUFFICIENCY. CONDITIONS OF USE ARE BEYOND VW&R'S CONTROL AND THEREFORE USERS ARE RESPONSIBLE TO VERIFY THIS DATA UNDER

NOVACHEM CORPORATION

N-50

NOVATE SM-40

NOVATE SM-40 IS A TECHNICAL GRADE ORGANIC INTERMEDIATE TO BE USED ONLY IN FORMULATING AND COMPOUNDING. THIS PRODUCT IS NOT TO BE USED OR MARKETED IN ITS PRESENT FORM AS AN ECONOMIC POISON OR PESTICIDE.

COMPOSITION:	AN AQUEOUS SOLUTION OF SODIUM DIMETHYL DITHIO-CARBAMATE
PHYSICAL STATE:	CLEAR LIQUID
COLOR:	YELLOW LIQUID
SPECIFIC GRAVITY 25°C.:	1.140
SOLIDS %:	40% MINIMUM
SOLUBILITY:	SOLUBLE IN WATER
STORAGE STABILITY:	GOOD IN GLASS, STAINLESS STEEL OR SUITABLY LINED CONTAINERS
STANDARD CONTAINER:	55 GALLON DRUM OR BULK

P.O. Box 6379, 1505 Potts Avenue High Point, North Carolina 27262 919-885-0041

[illegible]IR OWN OPERATING CONDITIONS TO DETERMINE WHETHER THE PRODUCT [illegible] TABLE FOR THEIR PARTICULAR PURPOSES AND THEY ASSUME ALL [illegible] THEIR USE, HANDLING, AND DISPOSAL OF THE PRODUCT, OR FROM THE [illegible] TION OR USE OF, OR RELIANCE UPON, INFORMATION CONTAINED HEREIN. [illegible] INFORMATION RELATES ONLY TO THE PRODUCT DESIGNATED HEREIN, [illegible] RELATE TO ITS USE IN COMBINATION WITH ANY OTHER MATERIAL OR [illegible] PROCESS.

--------------------REVISION--------------------

01/90: ADDED CAS NUMBERS.

*** E N D O F M S D S ***

PROD: 04004597 [illegible] 19 FEB 1990 CUST. [illegible] [illegible]

Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard, 29CFR 1910. 1200. Standard must be consulted for specific requirements

NOVATE SM-40

IDENTIFIER
Common Name (used on label and list)

SECTION 1

Manufacturer's Name: NOVUM CORPORATION

Address: 1505 POTTER AVENUE P.O. BOX 6378

City, State, and ZIP: HIGH POINT N.C. 27264

Emergency Telephone No.: 919-885-9041

Other Information Calls: 919-885-0041

Signature of Person Responsible for Preparer: (illegible)

Date Prepared: 2-12-90

SECTION 2 - HAZARDOUS INGREDIENTS/IDENTITY

Hazardous Components (Chemical & common names)	OSHA PEL	ACGIH TLV	Other Exposure Limits	% (optional)	CAS NO
SODIUM DIMETHYLDITHIOCARBAMATE	NOT ESTABLISHED			40	128-04
WATER				60	

HMIS RATING :

HEALTH 2

FLAMMABILITY 0

REACTIVITY 1

PERSONAL PROTECTION ..... D

SECTION 3 - PHYSICAL & CHEMICAL CHARACTERISTICS

Boiling Point: 100°C

Vapor Density (Air = 1): N/A

Specific Gravity (H2O = 1): 1.14

Vapor Pressure (mm Hg): N/A

Solubility in Water: @ 25°C COMPLETE

Appearance and Odor: YELLOW LIQUID MILD AMINE ODOR

Low Density in Water: NOT REACTIVE

Melting Point: N/A

SECTION 4 - FIRE & EXPLOSION DATA

Flash Point: N/A

Method Used: AQUEOUS SOLUTION

Flammable Limits - LEL Volume %: N/A

UEL Upper: N/A

Auto Ignition Temperature: N/A

Extinguisher Media: WATER - NOT NORMALLY FLAMMABLE

Special Fire Fighting Procedures: WATER

Unusual Fire and Explosion Hazards: HIGH HEAT MAY DRIVE OFF FUMES OF HYDROGEN SULFIDE.

SECTION 5 – PHYSICAL HAZARDS (REACTIVITY DATA)

Stability: Unstable / Stable (X) — Conditions to Avoid: —

Incompatibility (Materials to Avoid): STRONG ACIDS AND OXIDIZING AGENTS

Hazardous Decomposition Products: HCl GAS, SULFUR OXIDES, AMINES, CARBON MONOXIDE

Hazardous Polymerization: May Occur / Will Not Occur (X) — Conditions to Avoid: —

SECTION 6 – HEALTH HAZARDS

1. Acute: IRRITATION — 2. Chronic: —

Signs and Symptoms of Exposure: EYES AND SKIN – IRRITATION AND REDNESS. PRODUCT IS CAUSTIC TO EYES AND SKIN.

Medical Conditions Generally Aggravated by Exposure: NOT KNOWN

Chemical Listed as Carcinogen or Potential Carcinogen	National Toxicology Program	IARC	OSHA
	Yes ( ) / No (X)	Yes ( ) / No (X)	Yes ( ) / No (X)

Emergency and First Aid Procedures: CORROSIVENESS TO THE SKIN AND EYES IS A PRIMARY HAZARD.

ROUTES OF ENTRY:

1. Inhalation — MOVE TO FRESH AIR.
2. Eyes — FLUSH WITH WATER FOR 15 MINUTES. CONTACT PHYSICIAN.
3. Skin — WASH WITH SOAP AND WATER.
4. Ingestion — NO KNOWN ANTIDOTE. TREAT SYMPTOMATICALLY. DRINK MILK OR EGG WHITES SOLUTION IF AVAILABLE.

SECTION 7 – SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Precautions to be Taken in Handling and Storage: PRODUCT HAS A HIGH pH (11-12) AND IS CAUSTIC TO THE EYES AND SKIN. HARMFUL IF ABSORBED THROUGH SKIN.

Other Precautions: AVOID PROLONGED CONTACT WITH PRODUCT.

Steps to be Taken in Case Material is Released or Spilled: CONTAIN AND RECOVER. PRODUCT IS TOXIC TO FISH. DO NOT DISCHARGE INTO PUBLIC WATERS.

Waste Disposal Methods (Consult Federal, State, Regulations): INCINERATION IN ACCORDANCE TO STATE AND FEDERAL REGULATIONS.

SECTION 8 – SPECIAL PROTECTION INFORMATION/CONTROL MEASURES

Respiratory Protection (Specify Type): MASK AND CANISTER FOR ORGANIC VAPORS

Ventilation: Local Exhaust: TO COMFORT — Mechanical (General): — Special: — Other: —

Protective Gloves: RUBBER — Eye Protection: FULL FACE SHIELD

Other Protective Clothing or Equipment: RUBBER BOOTS & APRON

Work/Hygienic Practices: AVOID EYE AND SKIN CONTACT

IMPORTANT

Do not leave any blank spaces. If required information is unavailable, unknown, or does not apply, so indicate.

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SORRELLS RESEARCH
LABORATORY AND FIELD SERVICES

8002 STANTON ROAD
LITTLE ROCK, ARKANSAS 72209

(501) 562-8139

LABORATORY ANALYSIS

Date of Report: March 24, 1992
Date Received: February 27, 1992

For: VICKERS, INCORPORATED 400 LINCOLN AVENUE, SEARCY AR 72143
Job: TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP)
Sample From: Enstrip Batch Treatment Sludge - Purchase Order C23946

EPA HW No.	CONTAMINANT	CAS NO.	REGULATORY LEVEL		FOUND MG/L
D004	Arsenic	7440-38-2	5.0	<	0.1
D005	Barium	7440-39-3	100.0	<	5.0
D018	Benzene	71-43-2	0.5	<	0.001
D006	Cadmium	7440-43-9	1.0	<	0.1
D019	Carbon tetrachloride	56-23-5	0.5	<	0.001
D020	Chlordane	57-74-9	0.03	<	0.01
D021	Chlorobenzene	108-90-7	100.0	<	0.001
D022	Chloroform	67-66-3	6.0	<	0.001
D007	Chromium	7440-47-3	5.0		0.004
D023	o-Cresol	95-48-7	200.0	<	0.01
D024	m-Cresol	108-39-4	200.0	<	0.01
D025	p-Cresol	106-44-5	200.0	<	0.01
D026	Cresol	.....	200.0	<	0.03
D016	2,4-D	94-75-7	10.0	<	0.01

Laboratory Analysis Conducted According to EPA 40 CFR PART 261.
EPA Method 1311.

COPIES TO: 1- Above; Attn: R. Lea

LABORATORY NO. J760.001 VICK PASS [X] FAIL [ ]

REPLSM VICJ7601

REVIEWED BY K. E. SORRELLS, M.S. [T....E

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EPA HW NO.	CONTAMINANT	CAS NO.	REGULATORY LEVEL	FOUND MG/L
D027	1,4-Dichlorobenzene	106-46-7	7.5	< 0.01
D028	1,2-Dichloroethane	107-06-2	0.5	< 0.001
D029	1,1-Dichloroethylene	75-35-4	0.7	< 0.01
D030	2,4-Dinitrotoluene	121-14-2	0.13	< 0.01
D012	Endrin	72-20-8	0.02	< 0.01
D031	Heptachlor (and Heptachlor epoxide	76-44-8	0.008	< 0.008
D032	Hexachlorobenzene	118-74-1	0.13	< 0.01
D033	Hexachlorobutadiene	87-68-3	0.5	< 0.001
D034	Hexachloroethane	67-72-1	3.0	< 0.01
D008	Lead	7439-92-1	5.0	< 0.05
D013	Lindane	58-89-9	0.4	< 0.01
D009	Mercury	7439-97-6	0.2	< 0.01
D014	Methoxychlor	72-43-5	10.0	< 0.01
D035	Methyl ethyl ketone	78-93-3	200.0	< 0.01
D036	Nitrobenzene	98-95-3	2.0	< 0.01
D037	Pentachlorophenol	87-86-5	100.0	< 0.01
D038	Pyridine	110-86-1	5.0	< 0.01
D010	Selenium	7782-49-2	1.0	< 0.1
D011	Silver	7440-22-4	5.0	< 0.5
D039	Tetrachloroethylene	127-18-4	0.7	< 0.001
D015	Toxaphene	8001-35-2	0.5	< 0.01
D040	Trichloroethylene	79-01-6	0.5	< 0.001
D041	2,4,5-Trichlorophenol	95-95-4	400.0	< 0.01
D042	2,4,6-Trichlorophenol	88-06-2	2.0	< 0.01
D017	2,4,5-TP (Silvex)	93-72-1	1.0	< 0.01
D043	Vinyl chloride	75-01-4	0.2	< 0.01

IGNITABILITY	FP .F	> 140 .F	NEGATIVE
CORROSIVITY	.....	< 2 OR > 12.5	NEGATIVE (pH 7.78)
REACTIVITY	.....	SEE BELOW	SEE BELOW
Total releasable cyanide		250 mg/kg as HCN	< 1
Total releasable sulfide		500 mg/kg as H2S	< 1
Solids	Percent	NA	100

LABORATORY NO. J760.001 VICK PASS [X] FAIL [ ]

REPLSM RITJ7601

REVIEWED BY K. E. SORRELLS, M.S. [ ]

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8002 STANTON ROAD
LITTLE ROCK, ARKANSAS 72209

(501) 562-8139

SORRELLS RESEARCH - TCLP - VICKERS, INC. -

ANALYTE	INITIALS	DATE	TIME	S.D./RECOVERY
Non-Volatile Extract	BWG	03 - 02	0900	
Volatile Extract	BWG	03 - 02	0900	
Arsenic	KESII	03 - 12	1601	3.6 %
Barium	KESII	03 - 12	1110	0 %
Cadmium	KESII	03 - 12	1101	0 %
Chromium	KESII	03 - 11	1314	6.3 %
Lead	KESII	03 - 09	1739	0.3 %
Mercury	KESII	03 - 12	1630	8.1 %
Selenium	KESII	03 - 12	1545	1.7 %
Silver	KESII	03 - 12	0950	7.3 %
Volatile Organics	ES	03 - 10	0930	9.3 % / 82 %
Semi-Volatiles Organics	ES	03 - 05	0825	0.67 % / 66.7 %
Ignitability	BWG	03 - 11	1405	
Corrosivity	BWG	03 - 11	1405	
Solids	BWG	03 - 11	1405	
T. Releasable Cn-	BWG	03 - 11	1145	0 %
T. Releasable Sulfide	BWG	03 - 23	1055	0 %

LABORATORY NO. J760.001 VICK PASS [X] FAIL [ ]

REPLSM VICJ7601

REVIEWED BY K. E. SORRELLS, M.S. [signature]

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6002 STANTON ROAD
LITTLE ROCK, ARKANSAS 72209

(501) 562-8139

LABORATORY ANALYSIS

Date of Report: April 29, 1992
Date Received: February 27, 1992

FOR: Vickers, Inc., 400 Lincoln Ave., Searcy, AR 72143
JOB: Specified Analysis.
SAMPLE FROM: .001 = Enstrip Batch Treatment Sludge "non Hazardous" 01-31-92

ANALYTE	UNITS	Found
Copper	ppb	38700 (38.7 mg/kg)
Nickel	ppb	59550000 (59550 mg/kg)
Zinc	ppb	37200 (37.2 mg/kg)
% Moisture	percent	63.2

Collected by: Above.
Analysis by: K. E. Sorrells II

Sample Preservation and Laboratory Analysis Conducted According to EPA 40 CFR Part 136. Test/Analyst/Time/Coeff./Var./ QA Plan filed with A.D.P.C. & E. Includes 10 % Replication and 10 % Recovery Studies by Random Selection. Calibration Records Maintained.
CU/KESII/04-07/(1420)/ NI/KESII/04-22/(0945)/ ZN/KESII/04-07/(1350)/

Copies to- 1-Above; ATTN: Mr. R. Lea
FAX # [ ] 1-279-2316

LAB NO. J760.001 VICK DKS/TRG Reviewed by: K.E. Sorrells, M.S. [K.E.S.
AMENDED REPORT BY DKS ON 05-14-92

Sorrells Research **QC Data**

Log #	Date	Analyte	% Recovery	D1 Spike Results	D2 Spike Results	Average Results	D1 Sample Results	D2 Sample Results	% S.D.	Spike Amounts	Number In Set
J760.001	3-5-92	semi volatile surrogate	67	531.6	535.9	533.75			.6	800	18
	3-7-92	MEK	82	349.240	306.309	327.77			9.3		
	3-11-92	pH				7.78	7.75	7.81	.4		20
	3-11-92	CR	120.6	4840	4810	4825	4.82	4.26	6.3	4000	20
	3-12-92	As	87	721.5	671.2	696	<5	<5	3.6	800	20
	3-12-92	BA				<5	<5	<5	0		13
	3-12-92	Cd	120.6	1107	1304	1206	<0.5	<0.5	0	1000	20
	3-12-92	Se	113	922.5	891.1	906.8	<5	<5	1.7	800	20
	3-12-92	Ag				<0.5	<0.5	<0.5	0		13
	3-12-92	Hg	70	6.8	7.2	7.0	<0.01	<0.01	8.1	10	20
	3-20-92	Pb	95.7	59.7	55.1	57.4	<5	<5	0.3	60	20
	3-13-92	CN-	101.5	2.02	2.05	2.03	0	0	0	2	2
	3-23-92	Sulfide	88.9	1.339	1.333	1.336	<1	<1	0	1.5	4

CHAIN OF CUSTODY RECORD

LAB# J760.001

NAME OF COMPANY, CITY, OR PROJECT: Vickers Inc

SAMPLERS: (signature)

SAMPLE COLLECTION LOCATION	DATE	TIME	COMP	GRAB	NO. OF CONTAINERS	ANALYSIS REQUIRED
	1-31-92					(2) TCLP Matrix spike analysis
						EPA Total Metals [redacted]
						% Moisture
						Ignitability
						Reactivity
						Corrositivity

RELINQUISHED BY: (signature) RECEIVED BY: (signature) DATE/TIME

C K Sorrells 2/27/92 1005

DISPATCHED BY: (signature) RECEIVED FOR LABORATORY BY: DATE/TIME

2-27-92. 1020

Method of Shipment (CIRCLE ONE) UPS BUS WALK-IN SRA COURIER OTHER COURIER

NOTES: STANDARD METHODS PRESERVATION per EPA 40 CFR part 136

SHOW PRESERVATION; e.g.: C 4 = cool to 4.C.
S\2 = Sulfuric Acid to pH < 2.
N\2 = Nitric Acid to pH < 2.
(T) = Thiosulfate for dechlorination
SHOW EACH TYPE CONTAINER ON SEPARATE LINE.

P.H. -
Temp -
Flow -
CL2 -
D.O. -

SORRELLS RESEARCH ASSOCIATES, INC.
(501) 562-8139

COLE

Vickers, Incorporated
400 Lincoln Avenue
Searcy, Arkansas 72143
U.S.A.

VICKERS
A TRINOVA Company

Transmission Request

PAGE 1 of: 12

Admin. Services

FAX NO. 501-279-2316

MESSAGE NUMBER:

☒ FACSIMILE ☐ ELECTRONIC MAIL IS NOT AVAILABLE FOR THIS TRANSMISSION ☐ TELEX

FROM: [redacted] TELEPHONE NO. 501-268-5854 COST CENTER MAILBOX LOCATION ☐ ROUTINE ☒ URGENT

TO: DAVID BROWN LOCATION: ARK. DPC & E DATE 9/17/91

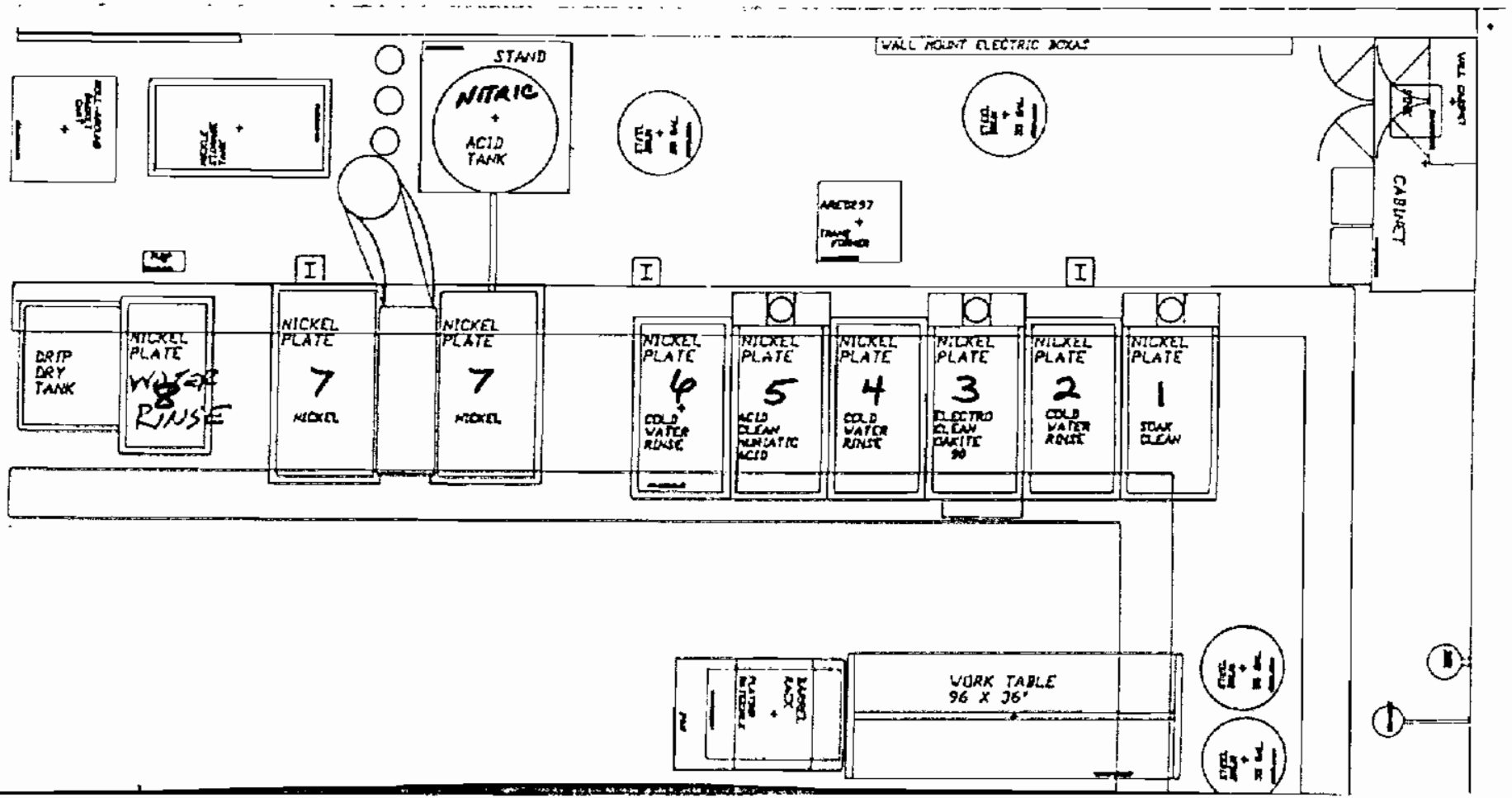
FAX # 501-562-4632

DAVID,

I HAVE INDICATED ON the DIFFERENT PROCESS STEPS The HAZARDOUS INGREDIENTS PER MSDS on MATERIALS USED. The other ingredients are considered proprietary By the chemical manufacturer and are not given on the MSDS. IF further info is required please call

Thanks
R. [redacted]

PLATING OPERATION PROCESS
Description. Originally sent
To you on 9/17/91
R [redacted]



PLATING SEQUENCE → 1, 2, 3, 4, 5, 4, 3, 4, 6, 7, 8

Note: TANK 7 - only one TANK is USED during plating process while the other is Being cleaned. Nitric ACID is used to STRIP excess Nickel FROM sides of TANK and fixtures.

PROCESS DESCRIPTION	PART 0222636 OP NO 0250 SHT 2 OF 3
MACHINE SETUP AND PROCESS DESCRIPTION	QTY LC TOOL CODE TOOL NO. DET DESCRIPTION

"ELECTROLESS NICKEL PLATING PROCESS PROCEDURE"

1. LOAD PARTS IN BASKETS AND DEGREASE.
2. CHECK SIZE OF PARTS TO DETERMINE AMOUNT OF PLATING REQUIRED.
3. CHECK THICKNESS OF TEST SHIMS.
4. HANG PARTS ON APPROPRIATE RACKS ALONG WITH TEST SHIMS.
5. A. PARTS MUST STAY IN THIS TANK A MINIMUM OF 5 MINUTES BUT NEVER MORE THAN 30 MINUTES.
   B. ONCE PARTS BEGIN THIS PROCESS THEY MUST NOT STOP UNTIL THEY COMPLETE THE ENTIRE PROCESS.
6. TRANSFER PARTS TO RINSE TANK AND RINSE WELL.
7. ELECTRO-CLEAN PROCESS (RECTIFIER SET @ 5 VOLTS)
   A. HANG 3 RACKS OF PARTS ON CONTACT BAR. ONE RACK PER TANK COMPARTMENT. MAX. LOAD IS 36 PARTS.
   B. CLAMP SWITCH FOR CATHODIC CHARGE FOR 15 SECONDS.
   C. REVERSE SWITCH FOR ANODIC CHARGE AND ACTUATE FOR THIRTY SECONDS.
   D. REPEAT STEPS 'B' AND 'C' FOR A TOTAL OF 3 CYCLES.
   NOTE: THIS PROCESS MUST ALWAYS END ON ANODIC CURRENT.
8. TRANSFER PARTS TO RINSE TANK AND RINSE WELL.
9. PLACE PARTS IN MURATIC ACID AND HOLD UNTIL EVEN GASSING HAS OCCURRED ON ALL PARTS.
10. TRANSFER PARTS TO RINSE TANK AND RINSE WELL.
11. ELECTRO-CLEAN PROCESS (RECTIFIER SET @ 5 VOLTS)
   A. HANG RACK OF PARTS ON CONTACT BAR. ONE RACK PER TANK COMPARTMENT. MAX LOAD IS 36 PARTS.
   B. CLAMP SWITCH FOR CATHODIC CHARGE FOR 15 SECONDS.
   C. REVERSE SWITCH FOR ANODIC CHARGE AND ACTUATE FOR THIRTY SECONDS.
   D. REPEAT STEPS 'B' AND 'C' FOR A TOTAL OF 3 CYCLES.
   NOTE: THIS PROCESS MUST ALWAYS END ON ANODIC CURRENT.
12. TRANSFER PARTS TO RINSE TANK AND RINSE WELL.

PRINTED: 09/17/91 EXPIRES: 12/16/91

Work Order:

CHANGE DATE: 010290 BY: C JORDEN

PROCESS DESCRIPTION	PART 0222636 OP NO 0250 SHT 3 OF 3
MACHINE SETUP AND PROCESS DESCRIPTION	QTY LC TOOL CODE TOOL NO. DET DESCRIPTION

13. TRANSFER PARTS TO NEXT RINSE TANK AND RINSE WELL.
14. HANG PARTS IN ELECTROLESS NICKEL PLATING TANK.
    A. PLACE PARTS SO THAT THEY DO NOT CONTACT OTHER PARTS, TANK WALLS, OR THE HEATER.
    B. NOTE AND RECORD TIME WHEN PARTS GO INTO TANK.
    C. BASED ON PREDETERMINED PLATING RATE,CHECK THE TEST SHIM AT LEAST TEN MINUTES PRIOR TO THE THEORETICAL COMPLETION TIME TO PREVENT OVER PLATING. CHECK THE TEST SHIMS AS OFTEN AS NEEDED TO CONTROL SIZE.

NOTE: ONCE A PART HAS BEEN REMOVED FROM THE NICKEL BATH, IT MUST NOT BE RETURNED. THIS WILL CAUSE LAYERED COATING, WHICH WILL PEEL OFF.

15. RINSE IN HEATED RINSE TANK. LET PARTS SOAK FOR 2 TO 3 MINUTES FOR THOROUGH RINSING.
16. HANG PARTS ON RACK TO AIR DRY.
17. REMOVE PARTS FROM RACKS AND LOAD INTO OVEN TRUCK.
18. WHEN OVEN TRUCK IS LOADED, PLACE IN BAKE OVEN AND BAKE AT 550 DEGREES F. FOR (2.5) HOURS AT HEAT.
19. AFTER BAKING PROCESS, PLACE PARTS IN APPROPRIATE TRAYS TO PREVENT DAMAGE DURING MOVEMENT.

PRINTED: 09/17/91 EXPIRES: 12/16/91
Work Order:

CHANGE DATE: 010290 BY: C JORDEN

TANK #1
"SOAK CLEAN"

"C

–CLEANING AGENT IS "SOAK 417" MIXED AT THE RATE OF 8.0% BY VOLUME OF WATER. IT REQUIRES 12 GALLONS FOR A COMPLETE NEW TANK MAKEUP.

Potassium Hydroxide
10-15 %

–TITRATE EVERY 5 DAYS **OPERATING TEMP. 180 DEGREES F.**

–WHEN REPLENISHMENT OF 90% HAS BEEN MADE, AND ANOTHER IS REQUIRED, DO NOT ADD TO THIS SOLUTION, BUT DRAIN TANK & MAKE UP A NEW BATCH. REPLACE BATH PER THIS SCHEDULE, OR ONCE A MONTH, WHICHEVER OCCURS FIRST.

––TITRATION PROCEDURE: (USE MACDERMID TEST KIT OR, TITRATE WITH 10ml OF SOLUTION FROM THE TANK AND ADD 50ml OF DE–IONIZED WATER. ADD 3 TO 5 DROPS OF PHENOLPHTHALEIN, UNTIL THE SOLUTION TURNS RED. TITRATE WITH 0.5n HYDRO–CHLORIC ACID AND AGITATE UNTIL THE SOLUTION IS CLEAR. MEASURE THE AMOUNT OF 0.5n HCL USED. USE THE FOLLOWING FORMULA:

(ml OF 0.5n HCL USED) X (0.93) = CONCENTRATION %

EXAMPLE: (10ml) X (0.93) = 9.3% / VOLUME
ACCEPTABLE RANGE IS: 9.0% – 11% / VOLUME

OPERATING PROCEDURE

–PLACE RACKS OF PARTS & TEST SHIMS IN SOAK TANK.
–PARTS MUST STAY IN THIS TANK A MINIMUM OF 5 MINUTES, BUT NEVER MORE THAN 30 MINUTES.
–PARTS SHOULD FLOW CONTINUOUSLY THRU REMAINDER OF PROCESS ONCE THEY LEAVE THIS TANK.

TANK #2
"COLD WATER AGITATED RINSE"

RINSE FOR 1 MINUTE TO
INSURE THOROUGH RINSE

TANK #3
"ELECTRO - CLEAN"

-CLEANING AGENT IS "BRITE GLOSS M" MIXED AT THE RATE OF 10% /VOLUME OF WATER. IT REQUIRES 15 GALLONS FOR A COMPLETE NEW TANK MAKEUP.

Sodium Hydroxide 40-45 %

-TITRATE EVERY 5 DAYS OPERATING TEMP. 160 DEGREES F.

-WHEN REPLENISHMENT OF 90% HAS BEEN MADE AND ANOTHER IS REQUIRED, DO NOT ADD TO THIS SOLUTION, BUT DRAIN AND MAKE UP A NEW SOLUTION. REPLACE BATH PER THIS SCHEDULE, OR ONCE A MONTH, WHICHEVER OCCURS FIRST.

-TITRATION PROCEDURE: USE MACDERMID TEST KIT OR THE FOLLOWING TITRATION PROCEDURE:

a. TAKE A 5ml SAMPLE OF BATH, DILUTE WITH 50ml OF WATER.
b. ADD 3 TO 5 DROPS OF PHENOIPHTHALEIN INDICATOR.
c. TITRATE WITH 0.5n HYDROCHLORIC ACID UNTIL PINK COLOR JUST DISAPPEARS.
   ml OF 0.5n HCL X 0.6 = % OF BRITE GLOSS M.
   ACCEPTABLE RANGE @ 9.0 - 11.0

OPERATING PROCEDURE -

-VOLTAGE RECTIFIER SETTING SHOULD BE 5 VOLTS. AMMETER READING SHOULD NOT GO OFF SCALL (PEG OUT). IF THIS OCCURS, CLEANING WILL NOT BE ADEQUATE.
-HANG RACKS OF PARTS IN TANK, INSURING GOOD ELECTRICAL CONTACT WITH BUSS BARS.
-THE FOLLOWING CYCLE MUST BE CARRIED OUT THREE (3) TIMES FOR PROPER CLEANING.
-CLAMP SWITCH FOR CATHODIC CHARGE FOR 15 SEC.
-REVERSE SWITCH FOR ANODIC CHARGE FOR 30 SEC.

(PROCESS MUST ALWAYS END WITH ANODIC CURRENT FLOW)

TANK #4
"COLD WATER RINSE"

RINSE FOR 1 MINUTE TO

INSURE THOROUGH RINSE

-PARTS SHOULD FLOW CONTINUOUSLY THRU REMAINDER OF PROCESS ONCE THEY LEAVE THIS TANK.

TANK #5
"ACID CLEAN"

-ACID SOLUTION IS MADE UP OF MURATIC ACID, 20 DEGREE BAUME, MIXED AT THE RATE OF 55 GAL. ACID PER 100 GAL OF WATER, = 30% SOLUTION.
-ACID SOLUTION MUST BE REPLACED WHENEVER THE SOLUTION BECOMES CLOUDY ENOUGH THAT THE BOTTOM OF THE TANK IS NOT VISIBLE.
-WHEN REPLENISHMENT OF ACID HAS EQUALLED THE ORIGINAL MAKEUP, THE TANK SHOULD BE DRAINED & RECHARGED.

-TITRATION PROCEDURE:
TO 5ml. OF MURATIC ACID SOLUTION, ADD 50ml. OF DE-IONIZED WATER. ADD SMALL AMOUNT OF METHYL ORANGE INDICATOR UNTIL SOLUTION TURNS RED. ADD SODIUM HYDROSIDE SOLUTION (1 NORMAL) UNTIL THE SOLUTION TURNS YELLOW. MEASURE THE AMOUNT OF SODIUM HYDROXIDE IN ml. (I.E. 12). USE THE FOLLOWING FORMULA: (ml. OF SODIUM HYDROXIDE) X (1.725) = CONCENTRATION OF ACID.

EXAMPLE: (12 ml.) (1.725) = 20.7%
ACCEPTABLE RANGE IS 25 - 30%

OPERATING PROCEDURE:
- HANG RACKS OF PARTS IN TANK AND HOLD UNTIL EVEN GASSING IS OBSERVED COMING FROM ALL PARTS.

TANK #6
COLD WATER AGITATED RINSE"

RINSE FOR 1 MINUTE TO

INSURE THOROUGH RINSE

REVERSE SWITCH FOR ANODIC CHARGE FOR 30 SEC.

(PROCESS MUST ALWAYS END WITH ANODIC CURRENT FLOW)

TANK #7
"NICKEL PLATE"

"H

-PLATING SOLUTION CONSISTS OF "ELNIC 101" CONCENTRATE AND DE-IONIZED WATER MIXED IN THE RATIO OF 4 PARTS WATER & (1) PART ELNIC C-5 CONCENTRATE OR 20%/VOLUME.

-OPERATING CONDITIONS: AIR AGITATION MUST BE ON. CIRCULATING PUMP & FILTER MUST BE ON & BATH TEMPERATURE MUST BE MAINTAINED AT 188 - 194 DEGREES F.

-P.H.TEST STRIPS ARE TO BE USED EVERY HOUR(RECORD IN LOG BOOK). P.H. MUST BE MAINTAINED BETWEEN 4.7 & 4.9 WITH 4.8 OPTIMUM.

-TITRATE BATH EVERY HOUR WHILE RUNNING PARTS. TITRATION DATA & ADDITIONS MUST BE RECORDED.

-TITRATION PROCEDURE: REMOVE 5ml OF BATH SOLUTION & ADD TO 50ml OF DE-IONIZED WATER. ADD 20ml OF AMMONIA. ADD A SMALL ANOUNT OF "MUREXIDE" INDICATOR UNTIL SOLUTION TURNS "STRAW" COLOR AND ADD "EDTA" SOLUTION UNTIL SOLUTION TURNS PURPLE. MEASURE EDTA SOLUTION USED. FOR PROPER BATH CONCENTRATION, IT SHOULD RANGE BETWEEN (8.0 - 10.0).

OPERATING PROCEDURE:

-HANG RACKS OF PARTS IN NICKEL PLATE TANK

-POSITION RACKS SUCH THAT PARTS DO NOT CONTACT OTHER PARTS.

-NOTE TIME WHEN RACKS ARE PLACED IN TANK. (RECORD IN LOG BOOK BY PART NUMBER AND QUANTITY.)

-BASED ON PRE-DETERMINED PLATING RATE CHECK TEST SHIMS AT LEASE 10 MINUTES PRIOR TO THEIR THEORETICAL COMPLETION TIME, CHECK SHIMS AS REQUIRED TO INSURE PROPER SIZE CONTROL.

CAUTION: ONCE A PART HAS BEEN REMOVED FROM NICKEL SOLUTION, DO NOT RETURN TO THE SOLUTION AS COATING WILL BECOME LAYERED AND WILL PEEL OFF.

Sodium Hypophosphite
20-30 %
Ammonium BiCARBonate
5-10 %
LEAD - TRACE
NICKEL SULFATE
20-30 %

TANK #8

"HOT WATER AGITATED RINSE"

-WATER TEMP. 160 DEGREES F.-

RINSE FOR 2 MINUTES TO

INSURE THOROUGH RINSE