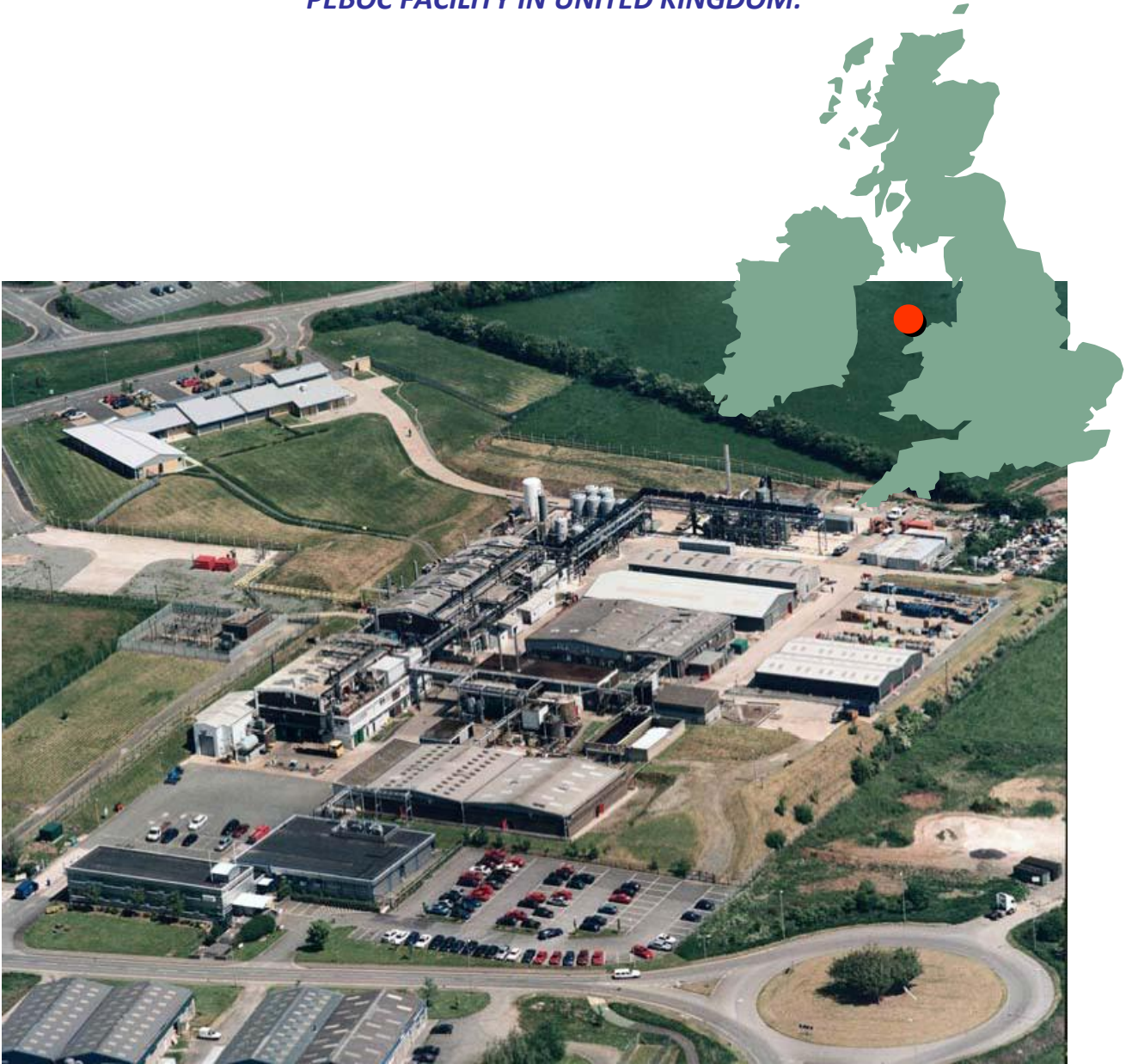


# PEBOC PLANT

## Information memorandum

*PEBOC FACILITY IN UNITED KINGDOM:*



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## **SITE HIGHLIGHTS**

### **CGMP INSPECTED SITE**

- AN FDA AND MHRA INSPECTED CGMP MANUFACTURING FACILITY, OFFERING A RANGE OF CAPABILITIES FOR THE PRODUCTION OF ORGANIC INTERMEDIATES AND PHARMACEUTICAL EXCIPIENTS.
- FULL RANGE OF SCALE FROM KILOGRAMS TO HUNDREDS OF TONS.
- AUDITED BY MORE THAN 24 DIFFERENT MULTINATIONAL PHARMACEUTICAL CUSTOMERS.

### **CHEMICAL AND ANALYTICAL DEVELOPMENT, INCLUDING**

- A PILOT PLANT.
- A CGMP SMALL-SCALE MANUFACTURING FACILITY.
- ALSO AVAILABLE A LEASED 1.600 SQ. M. TECHNOLOGY CENTER HOUSING STATE-OF-THE-ART R&D LABORATORIES AND SUPPORT FACILITIES; POSSIBILITY AND CONDITIONS OF ASSIGNMENT ARE BEING DISCUSSED WITH LESSOR THE WELSH ASSEMBLY GOVERNMENT

### **MANUFACTURING**

- WELL MAINTAINED, COMPREHENSIVE MIX OF MULTIPURPOSE EQUIPMENT DESIGNED FOR A WIDE RANGE OF CGMP AND OTHER FINE CHEMICAL APPLICATIONS.
- SYNTHESIS IS CARRIED OUT IN MULTIPURPOSE BATCH REACTORS IN GLASS AND STAINLESS STEEL RANGING FROM 100 L TO 4,500 L (0.1 M<sup>3</sup>– 4.5 M<sup>3</sup>).
- TOTAL PLANT CAPACITY IS APPROXIMATELY 75,000 L.
- FACILITIES INCLUDE A BROAD RANGE OF EQUIPMENT FOR THE HANDLING OF BOTH LIQUIDS AND SOLIDS.

### **PRODUCTION**

- RECENT PRODUCTION INCLUDES 5 PRODUCTS TOTALLING 9 CHEMICAL STEPS.

### **EXCELLENT SAFETY RECORD**

- SAFETY PERFORMANCE IS VERY GOOD
- ALL MANUFACTURING AREAS ARE FLAME-PROOF
- SITE DESIGNED TO HANDLE VOLATILE AND HIGHLY FLAMMABLE MATERIALS

### **NO ENVIRONMENTAL ISSUES**

- FLAMELESS THERMAL OXIDISER DESIGNED TO ABSORB VOC EMISSION FROM CAPACITY EXPANSION
- AWARDED THE GREEN DRAGON CERTIFICATE IN 2007

## **GENERAL SITE PRESENTATION**

MANUFACTURING IS BASED IN TWO PRODUCTION BUILDINGS DIVIDED INTO BOTH GENERAL- PURPOSE AND CGMP BATCH PLANTS, A CGMP HYDROGENATOR, A SMALL-SCALE CGMP MANUFACTURING UNIT AND A CGMP KILO LABORATORY.



### **ANCILLARY FACILITIES INCLUDE:**

- A 500 SQM QUALITY CONTROL LABORATORY WITH SEGREGATED WET AND DRY TECHNIQUE AREAS WITH FULL INSTRUMENTATION TO SUPPORT CGMP MANUFACTURING,
- A WEIGHING AREA,
- STABILITY TESTING AREA,
- OFFICES AND CONFERENCE ROOM;
- CGMP FINISHING ROOMS,
- SUPPORT SERVICES, FOR EXAMPLE, PURIFIED WATER AND A FLAMELESS THERMAL OXIDISER FOR VOC CONTROL.
- LEASE OF A 1600 SQM TECHNOLOGY CENTRE HOUSING DEVELOPMENT LABORATORIES & DEVELOPMENT ANALYTICAL LABORATORY; HIGH PRESSURE LABORATORY & SPECIAL GASES LABORATORY; POSSIBILITY AND CONDITIONS OF ASSIGNMENT ARE BEING DISCUSSED WITH LESSOR.

### **PRODUCTS PREVIOUSLY PRODUCED AT THE SITE**

- PHARMACEUTICAL API'S & INTERMEDIATES
- CUSTOM SYNTHESIS OF HIGH VALUE FINE CHEMICALS

### **CAPABILITIES**

- LAB > KILO LAB > PILOT PLANT > FULL SCALE CGMP PRODUCTION
- FLEXIBILITY TO ADAPT TO ALTERNATIVE PRODUCTION

#### **A STAND ALONE API AND PHARMACEUTICAL UNIT**

- FLEXIBLE PRODUCTION UNIT
- MANUFACTURING EXPENSES AND RELATED PRODUCTION MATERIALS OF AROUND 10 M€ IN 2006

#### **LAND AND BUILDING AREA**

- TOTAL: A SITE OF APPROXIMATELY 55 ACRES\*
- DEVELOPED: APPROXIMATELY 12 ACRES – AVAILABLE BUILDING LAND: 150 845 SQM
- WAREHOUSE 2 X 580 SQM & 1 x 380 SQM
- PRODUCTION 1025M<sup>2</sup> BUILDING AREA
- ADMINISTRATION 2400 SQM & SOCIAL 950 SQM TOTAL FLOOR AREA
- SUBJECT TO OBTAINING SATISFACTORY CONSENT TO ASSIGN A TECHNOLOGY CENTER of 1060 SQM.
- QUALITY CONTROL 500 SQM

#### **PHYSICAL TECHNOLOGIES**

- STIRRED BATCH REACTIONS
- CLARIFICATIONS TO REMOVE INSOLUBLES OR TO DECOLOURISE
- CRYSTALLIZATION
- FILTRATION (PRODUCT ISOLATION) INCLUDING CENTRIFUGATION
- VACUUM OR ATMOSPHERIC DISTILLATION
- EXTRACTION
- SEPARATION VIA DECANT OR FILTER LEG
- SOLIDS DRYING AND CGMP PACK-OUT
- IN-PROCESS SOLVENT RECOVERY

#### **REGULATORY ASSURANCE**

PEBOC HAS AN EXCELLENT REGULATORY RECORD. SAFETY PERFORMANCE IS EXCELLENT; UNDER EASTMAN MANAGEMENT THERE HAVE BEEN NO OSHA DAYS AWAY FROM WORK FOR OVER TEN YEARS AND ONLY ONE OSHA RECORDABLE INCIDENT FOR OVER THREE YEARS.

ENVIRONMENTAL PERFORMANCE IS GOOD AND THERE ARE GOOD, PROFESSIONAL RELATIONSHIPS WITH HEALTH, SAFETY AND ENVIRONMENTAL REGULATORS.

THE ENVIRONMENT AGENCY AUDITED THE SITE IN DECEMBER 2006, THERE WERE NO SIGNIFICANT NON COMPLIANCE IDENTIFIED ACTIONS. IN FEBRUARY 2007, THE SITE WAS ACCREDITED TO THE GREEN DRAGON LEVEL 4 ENVIRONMENTAL STANDARD (EQUIVALENT TO ISO 14000).

- CGMP QUALITY ASSURANCE SYSTEM BASED ON ISO 9000
- ISO 9001 REGISTRATION SINCE 1991; ISO 9001:2000 SINCE 2003
- SUCCESSFUL FDA INSPECTIONS 1985, 1990, 1995, 2004. ONLY ONE OBSERVATION WAS RAISED IN THE 2004 FDA INSPECTION, THIS WAS RESOLVED DURING THE AUDIT.
- MHRA INSPECTION (UK REGULATOR FULFILLING A SIMILAR ROLE TO THE FDA) 2001, 2003, 2006
- 4 DRUG MASTER FILES SUBMITTED FROM SITE (2 BULK API, 1 FACILITY, 1 PHARMA EXCIPIENT)
- 2 API PRODUCTS AND 1 ADVANCED INTERMEDIATE INCORPORATED INTO CUSTOMER NDA'S IN LAST 4 YEARS
- 24 PHARMACEUTICAL CUSTOMER AUDITS IN LAST 5 YEARS

## LOCATION

- APPROXIMATELY 1 KM SOUTH OF LLANGEFNI, ANGLESEY, POSTCODE LL77 7YQ
- NATIONAL GRID REFERENCE: SH 246200 374750
- COUNTY: ANGLESEY, WALES, UNITED KINGDOM



## LOGISTICS

- HIGHWAYS: LLANGEFNI LOCATED 2 KM FROM A55 EXPRESSWAY (EUROROUTE)
- PLANT LOCATED ON LLANGEFNI INDUSTRIAL ESTATE
- RAILROAD: NEAREST PASSENGER STATION BANGOR, 14 KM
- AIRPORT: MANCHESTER INTERNATIONAL, 150 KM BY MOTORWAY
- DEEP SEA PORTS:
  - HOLYHEAD, 20 KM FROM PEOC SITE WITH AN EXCELLENT ROAD LINK (THE A55 EXPRESSWAY)
  - LIVERPOOL PORT, 125 KM

## WALES & INWARD INVESTMENT (SOURCE: Welsh Assembly Government)

### WALES: A PRIVILEGED ENVIRONMENT FOR THE BIOSCIENCE INDUSTRY:

A THRIVING CLUSTER OF BUSINESSES OF ALL SIZES

LEADING COMPANIES INCLUDE:

- BIOTRACE INTERNATIONAL PLC
- BRITISH BIOCELL INTERNATIONAL
- CONVATEC LTD
- GE HEALTHCARE
- MERCK CHEMICALS LTD
- PROTHERICS
- SIMBEC RESEARCH
- WOCKHARDT

### AREAS OF EXPERTISE

- CLINICAL TRIALS AND DRUG DEVELOPMENT
- DIAGNOSTICS
- MEDICAL TECHNOLOGY
- SYSTEMS BIOLOGY
- AGRICULTURAL BIOTECHNOLOGY

6 ACCREDITED CENTRES OF EXCELLENCE FOR BIOSCIENCE

## **SKILLS AND TRAINING**

- A HIGHLY SKILLED AND STABLE WORKFORCE
- MORE THAN 15,000 PEOPLE WORK IN THE BIOSCIENCE INDUSTRY
- MORE THAN 12,000 BIOSCIENCE STUDENTS TRAINED IN WALES ARE AVAILABLE IN THE LABOUR MARKET EACH YEAR
- A DYNAMIC ACADEMIC ENVIRONMENT, WITH RENOWNED ACADEMIC INSTITUTES DEDICATED TO BIOSCIENCE (CARDIFF BIOSCIENCE SCHOOL, WELSH SCHOOL OF PHARMACY, SCHOOL OF HEALTHCARE STUDIES, BANGOR SCHOOL OF BIOLOGICAL SCIENCES) WHOSE RESEARCH INITIATIVES AND COLLABORATION WITH COMPANIES PARTICIPATE IN THE REGION'S EXPERTISE IN BIOSCIENCE.

## **SEVERAL INCENTIVES AVAILABLE IN WALES ACCORDING TO YOUR PROJECT**

- INTERNATIONAL BUSINESS WALES, THE INWARD INVESTMENT ARM OF THE WELSH ASSEMBLY GOVERNMENT, IS ONE OF EUROPE'S PREMIER BUSINESS DEVELOPMENT ORGANISATIONS. IT IS HIGHLY EFFECTIVE IN SUPPORTING COMPANIES TO IMPLEMENT AND DEVELOP THEIR PROJECTS INTO WALES.
- THE GRANTS FROM THE INTERNATIONAL BUSINESS WALES AGENCY ARE AVAILABLE IN MAXIMUM 40 DAYS AFTER YOUR DEMAND.
- A REGIONAL SELECTIVE ASSISTANCE (RSA) GRANT IS AVAILABLE FROM THE NATIONAL ASSEMBLY FOR WALES FOR CAPITAL INVESTMENT.
- THE AMOUNT OF INCENTIVES WILL VARY ACCORDING TO YOUR PROJECT.

## **INVESTMENT BY EASTMAN:**

### **LAST MAJOR INVESTMENTS** (DATES INDICATE FACILITY CONSTRUCTION OR REMODEL)

EQUIPMENT AND FURNISHINGS IN TECHNOLOGY CENTRE (1998)

QC LABORATORY (1999)

CGMP FINISHING ROOMS (2000)

- 2 HEPA AIR CGMP DRYING/PACK-OUT "SUITES"

WAREHOUSING AND BULK STORAGE

- BULK LIQUID TANKER STATION (1998)
- CHLORINE CONTAINMENT/DISPENSING BUILDING (2000)

ON-SITE SERVICES

- 2 BOILERS, WASTE WATER TREATMENT, THERMAL OXIDIZER (2000)
- USP 27 WATER (2000)

WELFARE FACILITY (1998)

- REMODELLED MALE/FEMALE LOCKER AND SHOWER FACILITIES
- OCCUPATIONAL HEALTH/FIRST AID CLINIC

MAINTENANCE WORKSHOP (1997)

UPGRADED PILOT PLANT TO CGMP (2002)

UPGRADED PB-2 PHARMA CONTROL AND SCRUBBING SYSTEMS (2004)

PB2 PHARMA REVAMP (1999)

PB1 PHARMA REVAMP (2000)

VOC PLANT (2001)

## **MANUFACTURING OPERATIONS**

THE EXISTING GENERAL-PURPOSE BATCH PLANTS ARE:

- PB1 HALOGENATION PLANT
- PB1 STEROL PLANT

THE EXISTING CGMP BATCH PLANTS ARE:

- PB1 PHARMA PLANT
- PB2 PHARMA PLANT
- PB2 GENERAL PURPOSE PLANT
- SMALL SCALE MANUFACTURING UNIT
- KILO LABORATORY

## **BASIC CHEMICALS**

BASIC CHEMICALS ARE STORED IN BULK TANKS AND DRUMS, DEPENDING ON THE VOLUMES NEEDED. REACTIVE CHEMICALS ARE PRIMARILY DELIVERED IN DRUMS OR IBC'S.

SPECIFIC CHEMICALS USED IN LAST 5 YEARS

- SULPHURIC ACID DRUMS, IBC'S
- HYDROCHLORIC ACID DRUMS, IBC'S
- SODIUM HYDROXIDE, 48% 23,000 L TANK, IBC'S
- AMMONIA AQUEOUS IN IBCS, GAS IN CYLINDERS
- BROMINE 10 MT TANK
- CHLORINE 1- TON CYLINDERS
- HYDROGEN TOTAL CAPACITY: 2736 CU.M@ 138 BAR.G
- HYDROGEN CHLORIDE 64 KILO CYLINDERS

## **ON SITE SUPPORT FUNCTIONS**

- QUALITY UNIT COMPRISED OF QUALITY ASSURANCE AND QUALITY CONTROL LABORATORIES
- PROCESS RESEARCH AND DEVELOPMENT LABORATORIES
- ENGINEERING OFFICES (SMALL PROJECTS)
- ADMINISTRATIVE AREAS

## **FLEXIBILITY OF MULTIPURPOSE UNITS**

- BATCH PLANT IS DESIGNED FOR HIGH DEGREE OF FLEXIBILITY.
- SWITCHING STATIONS (BULK CHEMICALS)
- COMMON REACTOR CONFIGURATION (DEDICATED CONDENSER, RECEIVER)
- FIXED TRANSFER PIPING IS USED BASED ON SAFETY, ENVIRONMENTAL HAZARDS, EFFICIENCY, AND LENGTH OF PRODUCTION CAMPAIGN.
- TYPICAL PRODUCT SWITCHOVER TIME IS 14 DAYS DEPENDING UPON SPECIFIC CGMP REQUIREMENTS, CLEANING DIFFICULTY AND SPECIAL EQUIPMENT ARRANGEMENTS.

## **MANUFACTURING AREAS & EQUIPMENT**

### **PB 1 PHARMA PLANT**

- REACTORS - 2 X 4500 LITRE GLASS LINED (1 INSTALLED, NOT COMMISSIONED)
- SUPPORT VESSELS
- 1 X 2500 LITRE GLASS LINED CRYSTALLISER
- 1 X 1600 LITRE GLASS LINED
- 1 X 2300 LITRE STAINLESS STEEL
- CENTRIFUGE – 1 X 420 LITRE STAINLESS STEEL, BOTTOM DISCHARGE
- LAMINAR FLOW BOOTHS AT MATERIAL CHARGING / DISCHARGING

### **PB 2 PHARMA PLANT**

- REACTORS
- 4 X 4500 LITRE GLASS LINED
- 1 X 2800 LITRE GLASS LINED
- 1 X 1280 LITRE AUTOCLAVE, HASTELLOY (60 BAR OPERATING CAPABILITY)
- SUPPORT VESSELS
- 1 X 2300 LITRE STAINLESS STEEL
- 1 X 1300 LITRE STAINLESS STEEL
- CENTRIFUGE – 1 X 420 LITRE HALAR LINED, BOTTOM DISCHARGE
- PADDLE-DRYER – 1 X 1MT CAPACITY, HASTELLOY
- LAMINAR FLOW BOOTHS AT MATERIAL CHARGING / DISCHARGING



#### **PB 2 GENERAL PURPOSE PLANT**

- REACTORS
- 1 X 2800 LITRE GLASS LINED
- 1 X 2300 LITRE GLASS LINED
- 1 X 1300 LITRE GLASS LINED
- 1 X 2700 LITRE STAINLESS STEEL
- SUPPORT VESSELS
- 1 X 2300 LITRE GLASS LINED CRYSTALLISER
- 1 X 1300 LITRE STAINLESS STEEL
- CENTRIFUGES
- 1 X 100 LITRE HALAR LINED
- 1 X 100 LITRE STAINLESS STEEL
- LAMINAR FLOW SYSTEMS AT PRODUCT HANDLING POINTS
- DRYER - 1X 250 KG ATMOSPHERIC TRAY DRYER, RESIN COATED
- FINISHING ROOMS X 2, CLASS 100,000 HEPA FILTERED AIR.
- DRYERS
- 1 X 250KG ATMOSPHERIC TRAY DRYER, RESIN COATED
- 1 X 500KG ATMOSPHERIC TRAY DRYER, STAINLESS STEEL (INSTALLED IN FINISHING ROOM)

#### **SMALL SCALE UNIT / PILOT PLANT**

- REACTORS
- 1 X 680 LITRE GLASS LINED
- 1 X 450 LITRE GLASS LINED
- SUPPORT VESSELS
- 2 X 340 LITRE GLASS LINED
- CENTRIFUGES
- 1 X 100 LITRE STAINLESS STEEL
- 1 X 28.9 LITRE STAINLESS STEEL
- DRYER - VACUUM TRAY DRYER STAINLESS STEEL
- LAMINAR FLOW BOOTHS AT MATERIAL CHARGING / DISCHARGING

#### **KILO LABORATORY**

- LABORATORY VENTILATION SYSTEM CLASS 100,000 HEPA AIR
- REACTOR – 1 X 100 LITRE BUCHI, GLASS
- FILTRATION EQUIPMENT – CERAMIC FILTERS

#### **PB1 GENERAL PURPOSE PLANT**

- REACTORS
- 1 X 2700 LITRE STAINLESS STEEL
- 1 X 2300 LITRE STAINLESS STEEL
- 2 X 1300 LITRE STAINLESS STEEL
- 1 X 1300 LITRE GLASS LINED
- 4 X 1300 LITRE GLASS LINED (CONFIGURED FOR HALOGENATION)
- CRYSTALLISERS
- 1 X 2300 LITRE STAINLESS STEEL
- 2 X 1300 LITRE STAINLESS STEEL
- CENTRIFUGES
- 1 X 420 LITRE HALAR LINED, BOTTOM DISCHARGE
- 1 X 200 LITRE, STAINLESS STEEL, BOTTOM DISCHARGE
- 1 X 100 LITRE, HALAR LINED
- FILTER DRYER – 1 X 1.5 CU. M STAINLESS STEEL
- PADDLE DRYER - 1 X 1MT CAPACITY, TITANIUM CLAD

## **SUPPORT FACILITIES**

### **TECHNOLOGY CENTRE (1998)**

- LEASED FROM WELSH ASSEMBLY GOVERNMENT
- 1060 M<sup>2</sup> CUSTOM-DESIGNED FACILITY
- 16-PERSON R&D LABORATORIES; 20- PERSON OFFICE WING

### **MAJOR ANALYTICAL INSTRUMENTATION OF R&D LABORATORIES**

- 1X JEOL 270 MHZ MULTINUCLEAR NMR
- 1X PERKIN ELMER "SPECTRUM ONE" FTIR SYSTEM
- 1X HP 1100 HPLC SYSTEMS
- 1X THERMOSEPARATION PRODUCTS HPLC SYSTEM (UNUSED FOR SOME TIME)
- 1X TA INSTRUMENTS DSC SYSTEM

### **QC LABORATORY (1999)**

- 500 M<sup>2</sup> DEDICATED FACILITY; SIZED FOR GROWTH

### **WAREHOUSING AND BULK STORAGE**

- WAREHOUSE CAPACITIES
- FINISHED PRODUCT WAREHOUSE (CGMP) 1100 SQ M
- RAW MATERIAL WAREHOUSE (CGMP) 450 SQ M
- PACKAGING WAREHOUSE (CGMP) 100 SQ M
- QUARANTINE WAREHOUSE (CGMP) 100 SQ M
- DRUM STORAGE WAREHOUSE (CGMP) 1500 SQ M (33% COVERED)
- 16 BULK STORAGE TANKS AND TANKER STATION
- TANK FARM - BULK STORAGE
  - TOLUENE
  - METHANOL
  - ETHANOL (ABSOLUTE DENATURED)
  - ETHANOL (96% DENATURED)
  - PETROLEUM ETHER (BP 45- 65 C)
  - MEK
  - SODIUM HYDROXIDE 48%
- BULK LIQUID TANKER STATION (1998)
- CHLORINE CONTAINMENT/DISPENSING BUILDING (2000)

### **LOGISTICS**

- GENERAL FREIGHT - TRUCK DELIVERIES
- TRUCK DELIVERY - LIQUIDS, PALLETISED SOLIDS, AND BULK SOLIDS
- TRUCK SHIPMENT - BULK LIQUIDS, PALLETISED DRUMS, SEMI- BULK BAGS, DRUMS
- CHEMICAL UNLOADING STATIONS
- BULK LIQUID UNLOADING : TRUCK
- DEDICATED TANKER LOADING/UNLOADING STATION
- WASTE SODIUM HYPOCHLORITE DEDICATED LOADING/UNLOADING STATION

### **WELFARE FACILITY (1998)**

- REMODELLED MALE/FEMALE LOCKER AND SHOWER FACILITIES
- OCCUPATIONAL HEALTH/FIRST AID CLINIC
- DOCUMENT ARCHIVE

## **MAINTENANCE WORKSHOP (1997)**

PURPOSE BUILT FACILITY TO SUPPORT SITE OPERATIONS

### **STEAM**

STEAM IS SUPPLIED FROM ONE OF TWO OIL-FIRED COCHRAN BOILERS; EACH BOILER IS RATED FOR 9000 LBS/HR STEAM GENERATION. STEAM IS SUPPLIED TO EACH OF THE TWO PRODUCTION BUILDINGS AT A PRESSURE OF 8 BARG AND REDUCED AT EACH BUILDING TO 4 BARG. THE BOILERS ALSO SUPPLY STEAM TO THE REST OF THE SITE INCLUDING STORES, QC AND ADMINISTRATION BUILDINGS WHERE IT IS USED. CONDENSATE IS RETURNED TO THE BOILERS VIA A NUMBER OF OGDEN PUMPS. STEAM AND CONDENSATE SUPPLY PIPE WORK IS MILD STEEL RUN ABOVE GROUND. WHEN THE SITE IS ON FULL CAPACITY BOTH BOILERS WOULD BE REQUIRED PARTICULARLY IN THE WINTER MONTHS.

#### **60# STEAM ENGINEERING UNITS: LBS./HR.**

- SYSTEM CAPACITY 18,000
- AVERAGE DEMAND 10,000
- PEAK DEMAND 15,000

### **ELECTRICITY**

ELECTRICITY IS CURRENTLY SUPPLIED TO THE MAIN SITE FACILITIES BY THE LOCAL UTILITY, EON, THROUGH AN 11 KV UTILITY SYSTEM SUBSTATION. TWO SITE TRANSFORMERS DROP THE SUPPLY VOLTAGE TO 415V, EACH TRANSFORMER RATED AT 800 KV (1200 A NOMINAL). FROM THE TRANSFORMERS MAIN SUPPLIES ARE TAKEN TO TWO MAIN DISTRIBUTION BOARDS WHICH SERVE THE SITE. A DIESEL GENERATOR PROVIDES A BACK-UP SUPPLY FOR THE PLANT, EXCLUDING THE VOC PACKAGE (FLAMELESS THERMAL OXIDIZER). THE TECHNOLOGY CENTRE IS FED FROM A SEPARATE UTILITY SUB-STATION LOCATED AT THE BUILDING, BUT NOT OWNED BY EASTMAN. LOAD IS CIRCA 80 KW.

- AVERAGE DEMAND 550 – 800 KW
- PEAK DEMAND 900 KW

### **COMPRESSED AIR:**

COMPRESSED AIR IS AVAILABLE ON SITE FROM A SINGLE BROOMWADE 6050 UNIT RATED AT 318 CFM AT 100 PSIG. THERE ARE TWO STANDBY HPC SCREW COMPRESSORS RATED AT 250 CFM AT 100 PSIG. THE AIR IS DRIED TO 80 DEG C DW PT AND PASSED THROUGH FILTERS TO REMOVE OIL FROM THE COMPRESSOR AND ANY PARTICLES. AT THE POINT OF USE THE AIR IS REDUCED IN PRESSURE TO 1 BARG IN EACH AIR RECEIVER. COMPRESSED AIR IS USED FOR BOTH PROCESS AND BREATHING AIR AND IT IS DISTRIBUTED WITHIN EACH AREA IN WHICH IS REQUIRED. NORMALLY BOTH COMPRESSORS ARE ON LINE AT THE SAME TIME.

THE AIR SUPPLY MAIN IS MOSTLY GALVANISED MILD STEEL PIPEWORK RUN ABOVE GROUND. THE COMPRESSORS AND PALL AIR DRIER ARE APPROXIMATELY TEN YEARS OLD.

### **NITROGEN:**

NITROGEN IS SUPPLIED TO THE SITE FROM RENTAL BOC LIQUID NITROGEN STORAGE TANK, PERMANENTLY INSTALLED. NITROGEN IS VAPORIZED AND THE PRESSURE LET DOWN TO 4 BARG AT THE TANK LOCATION. DISTRIBUTION OF THE NITROGEN IS AT THIS PRESSURE THROUGH A MILD STEEL AND COPPER PIPEWORK DISTRIBUTION SYSTEM. FURTHER PRESSURE REDUCTION TAKES PLACE AT THE MAIN POINTS OF USE DOWN TO 1 BARG. NITROGEN IS USED PRIMARILY FOR INERTING REACTORS.

- SYSTEM CAPACITY 190 NCU.M/HR
- AVERAGE DEMAND 150 NCU.M/HR
- PEAK DEMAND 190 NCU.M/HR

### **COOLING WATER:**

COOLING WATER IS SUPPLIED FROM ONE OF THREE COOLING TOWERS ON SITE. EACH OF THE MAIN PRODUCTION BUILDINGS HAS A DEDICATED COOLING WATER SUPPLY. THE THIRD COOLING WATER SUPPLY CAN BE SWITCHED BETWEEN EITHER BUILDING DEPENDING ON DEMAND. EACH POINT OF USE HAS A COOLING WATER RING MAIN SUPPLY AND RETURN. AT FULL CAPACITY EACH OF THE COOLING TOWERS CAN SUPPLY WATER AT 150 CU.M/HR GIVING A 10 DEG C TEMP DROP ACROSS THE PACKING.

**REFRIGERATION:**

THERE ARE TWO INDEPENDENT REFRIGERATION UNITS ON SITE EACH OF 260 KW CAPACITY AT A BRINE TEMPERATURE OF -15 DEG C. IN NORMAL CIRCUMSTANCES EACH UNIT IS DEDICATED TO SUPPLY COLD BRINE TO ONE PRODUCTION BUILDING. IT IS POSSIBLE TO SUPPLY BOTH BUILDINGS WITH COLD BRINE FROM ONE UNIT BY RECONFIGURING PIPE WORK. THE UNITS USE AMMONIA FOR THE PRIMARY REFRIGERATION AND NO FREON.

**GAS:**

A NEW 4" NATURAL GAS MAIN WAS INSTALLED IN 2000 TO SUPPLY THE NEW THERMAL OXIDISER, WITH CAPACITY FOR FUTURE SUPPLY TO THE BOILERS. THE HPE PIPE OPERATES AT 120MBAR. THERE IS ALSO AN ORIGINAL 3" GAS MAIN INSTALLED TO THE WELFARE BUILDING.

- AVERAGE DEMAND 50 NCU.M/HR
- PEAK DEMAND 120 NCU.M/HR

**PROCESS (POTABLE) WATER :**

PROCESS WATER IS AVAILABLE AT APPROX 6-8 BARG VIA THE TOWN'S POTABLE WATER SYSTEM. THE PROCESS WATER IS FED TO EACH OF THE PROCESSING BUILDINGS VIA AN INTERCEPTOR TANK AND A SAND FILTER. THIS SIX INCH MILD-STEEL RING MAIN SYSTEM ALSO SUPPLIES THE EMERGENCY SHOWERS AND THE FIRE MAIN.

- SYSTEM CAPACITY 170 M3/HR
- AVERAGE DEMAND 10 M3/HR
- PEAK DEMAND 15 M3/HR
- SUPPLIES PROCESS, POTABLE AND FIRE WATER FROM SUPPLY MAIN

**WASTE WATER TREATMENT SERVICE PROVIDER:**

WASTE WATER TREATMENT SERVICE PROVIDER IS CURRENTLY WELSH WATER PLC

- HIGH AERATION ACTIVATED SLUDGE TREATMENT FACILITY  
BIO-SLUDGE DISPOSAL: LAND APPLICATION VIA SPRAY IRRIGATION SYSTEM
- SITE AUTHORIZED DISCHARGE CAPACITY: 2,500KG./DAY COD (CHEMICAL OXYGEN DEMAND)
- SYSTEM CAPACITY 250 CU. M/DAY
- AVERAGE DEMAND 100 CU. M/DAY
- PEAK DEMAND 241 CU. M/DAY

**PURIFIED WATER USP 27:**

PURIFIED PROCESS WATER TO USP 27 STANDARD IS AVAILABLE IN PB1 AND PB2 PHARMA PLANTS. SUPPLIED FROM A COMMERCIAL PURIFICATION UNIT, THROUGH A POLISHED STAINLESS STEEL DISTRIBUTION SYSTEM INCLUDING A 4,000L STORAGE TANK. THE SYSTEM IS VALIDATED FOR CGMP PROCESS APPLICATIONS.

- SYSTEM CAPACITY 0.5 M3/HR
- AVERAGE DEMAND 0.17 M3/HR
- PEAK DEMAND 0.5 M3/HR

**LIQUID WASTE:**

- OFF-SITE DISPOSAL BY INCINERATION CURRENTLY DONE BY LICENSED CONTRACTORS
- BULK STORAGE CAPACITY FOR 76,000 L OF LIQUID WASTE
- ADDITIONAL STORAGE CAPACITY IN DRUMS OR IBCS IN BUNDED DRUM STORE

**SOLID WASTE:**

- NO ON-SITE DISPOSAL
- OFF-SITE DISPOSAL CURRENTLY DONE BY LANDFILL / INCINERATION BY LICENSED CONTRACTORS

**PLANT & INSTRUMENTATION AIR:**

- SYSTEM CAPACITY 500 SCFM
- AVERAGE DEMAND 250 SCFM
- PEAK DEMAND 400 SCFM

## REGULATORY REGIME

PERMITS ARE ISSUED BY THE ENVIRONMENT AGENCY, (EA), AND WELSH WATER AND THE SITE IS INSPECTED BY THE HEALTH AND SAFETY EXECUTIVE, (HSE), (SAFETY, PRINCIPALLY HAZARDOUS INSTALLATIONS)

SITE IS A LOWER-TIER COMAH SITE (SEVESO II DIRECTIVE)

## CURRENT ENVIRONMENTAL PERMITS

- PLANT IS OPERATED UNDER THE ENVIRONMENTAL PERMITTING REGULATIONS (PREVIOUSLY THE POLLUTION AND CONTROL (PPC) REGULATIONS)
- PLANT HOLDS ONE ENVIRONMENTAL PERMIT BU 7537 (PREVIOUSLY A PPC PERMIT) AND A CONSENT FROM WELSH WATER FOR THE DISCHARGE OF TRADE EFFLUENT
- PERMITS COVER EMISSION SOURCES TO AIR, SURFACE WATER, SEWER AND WASTE DISPOSAL
- TIME TO OBTAIN NEW ENVIRONMENTAL PERMIT OR MODIFICATION TO EXISTING PERMIT DEPENDS ON SCALE OF PROPOSED CHANGE. A NEW PERMIT APPLICATION MAY BE REQUIRED WHICH COULD BE A LONGER TIME FRAME
- MINOR MODIFICATIONS CAN BE OBTAINED IN 2-3 WEEKS.
- MAJOR PERMIT MODIFICATIONS ESTIMATED TO TAKE 5-6 MONTHS.
- THE WELSH WATER CONSENT MAY PASS WITH THE LAND TO A PURCHASER BUT WE RECOMMEND CONSULTATION WITH WELSH WATER REGARDING THIS
- EASTMAN INTENDS TO SURRENDER THE PERMIT BEFORE CLOSING OF THE SALE OF PEBOC

## CURRENT EASTMAN PERMIT LIMITS FOR WASTE WATER.

<u>Parameter</u>	<u>Permit Limits (kg/day)</u>		<u>Usage of Limits</u>	
	<u>Daily Max.</u>	<u>Daily Avg.</u>	<u>Daily Avg.</u>	<u>Daily Max.</u>
<b>COD</b>	<b>1,875</b>	<b>5.4%</b>		<b>67.5%</b>
<b>TSS</b>	<b>50</b>	<b>2.7%</b>		<b>44.0%</b>
<b>Ammonia- N</b>	<b>125</b>	<b>0%</b>		<b>0.9%</b>
<b>Solvents</b>	<b>1,250</b>	<b>1.5%</b>		<b>5.9%</b>
<b>Oil</b>	<b>87.5</b>	<b>0.5%</b>		<b>2.5%</b>
<b>Sulphate</b>	<b>500</b>	<b>7.3%</b>		<b>66.32%</b>
<b>Cyanide</b>	<b>0.5</b>	<b>0%</b>		<b>0%</b>
<b>Sulphide</b>	<b>0.5</b>	<b>0%</b>		<b>0%</b>
<b>Iodide</b>	<b>0.5</b>	<b>0%</b>		<b>0%</b>

## **QUALITY ASSURANCE**

### **REGULATORY SUBMISSIONS BY EASTMAN**

- 4 DRUG MASTER FILES SUBMITTED FROM SITE
- 1 PHARMACEUTICAL EXCIPIENT, VITAMIN E TPGS (TYPE IV DMF)

### **CURRENT QUALITY SYSTEMS**

- COMPREHENSIVE SYSTEM TO ISO AND CGMP REQUIREMENTS
- ISO 9002 SINCE 1992
- ISO 9001 SINCE 1994
- ISO 9001: 2000 SINCE JULY 2003
- QUALITY MANUAL
- DIVISION PROCEDURES
- STANDARD OPERATING PROCEDURES

### **QUALITY AUDIT SUMMARY**

- FDA INSPECTIONS
- 1985 METHOCARBAMOL BPC (483- 14 OBSERVATIONS)
- 1990 METHOCARBAMOL BPC (483- 7 OBSERVATIONS)
- 1995 PIVOTAL INTERMEDIATE (483- 8 OBSERVATIONS)
- 2004 API (483- 1 OBSERVATION)
- ISO AUDITS
- SEMI- ANNUAL FROM SGS YARSLEY
- CUSTOMER AUDITS
- 24 AUDITS FROM 10 PHARMA CUSTOMERS (2000-2006)
- MHRA INSPECTION (FORMERLY MCA)
- 2001, 2003, & 2006 FOR VITAMIN E TPGS

## MANUFACTURING CAPABILITIES

Chemistry	Peboc	
	Pilot Plant	Comm.
Hydrogenation	2	3
Condensation	3	3
Esterification	3	3
Etherification	3	3
Chlorination, HCl	3	3
Cl <sub>2</sub>	2	3
SOCI <sub>2</sub> , POCl <sub>3</sub>	3	3
Bromination, Br <sub>2</sub>	2	3
HBr	2	2
Chlorosulfonation	2	2
Oxidation, Ozone	1	1
Direct Air	1	1
Chlorine	1	2
Peroxide (H <sub>2</sub> O <sub>2</sub> )	2	2
Friedel Craft	2	2
Grignard, Use	2	3
Manufacture	0	0
Phosgenation	0	0
Chloromethylation	0	0
Amination	3	3
Oximation	3	3
Alkylation	3	3
Methylation	2	2
Nitration	3	2
Reduction, LAH	1	1
NaBH <sub>4</sub>	2	2
Fluorination	1	1
Asymmetric Synthesis	3	3
Optical Resolution	3	3
Enzyme Catalysis	2	3
Cyanation	2	2

 = No capability

1	2	3
↳ Limited technical capability	↳ Technical capability exists	↳ Full technical and manufacturing capability exists
↳ Have not handled this reaction in the past	↳ May have handled this chemistry in the past, but not currently practiced	↳ Material or chemistry handled on a routine basis
↳ Significant operational or safety barriers	↳ Could practice this chemistry within 3- 6 months with minimal capital	↳ Could make meaningful quantities within weeks
↳ Could not practice this chemistry in 3- 6 months without significant capital		↳ No significant operational or safety barriers
		No new capital required