

EMERGENCY
PROTECTION
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Plan for:

Remediation and Closure
at
American Xtal Technology
6780 Sierra Court, Suite I
Dublin, CA

April 25, 1997

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Facility Description

American Xtal Technology operates in a 19,000 square-foot leased facility, part of a larger multi-tenant, tilt-up concrete structure, located at 6780 Sierra Court, Suite I, Dublin, California. This site is comprised of offices (1st and 2nd floor), defined process areas which include the following departments: polysynthesis, crystal growth, cutting, grinding, annealing, slicing, lapping, polishing, testing, waste treatment, and warehouse storage.

The facility is owed and managed by B&G Management, 2520 College Avenue, Berkeley, CA, 94704 (Telephone No. 510-848-3608).

Principal Operations/Process Description

American Xtal Technology is a manufacturer of polycrystalline gallium arsenide wafers. These wafers are about a millimeter thick and are polished to a mirror finish. The manufacturing process is as follows:

1. **Polycrystalline gallium arsenide growth.** High purity (99.99+%) gallium and arsenic rock (about the size of Bb's) are placed in a glass boat inside a sealed glass tube. The vessel is evacuated. Under vacuum it is heated to 1240 °. The vapor of each metal combine to form chunks of polycrystalline gallium arsenide.
2. **Gallium arsenide ingot growth.** The chunks of polycrystalline gallium arsenide are again placed in a glass tube and heated to 1240 °. This melts forming a single crystal gallium m arsenide ingot about 2 to 6 inches in diameter and 4 to 6 inches long.
3. **Wafer formation.** The single crystal gallium arsenide ingot is then ground to a specific diameter using a lathe. The ingot is then sliced into wafers using a saw. The edges of each individual wafer are rounded using a grind wheel.
4. **Wafer surface preparation.** The individual wafers surface must now be reduced, made flat and polished to a mirror shine. The wafers are first ground on a lapping machine to remove surface thickness. Secondly, the wafers are polished, using a polishing machine. Lastly, the wafers are cleaned and rinsed with deionized water.
5. **Waste materials.** American Xtal Technology attempts to capture and retain gallium arsenide waste by -products. Gallium is a precious metal with high reclaim value.

Other Business Activity, Processes, and Products On Site

Other business activities, processes, products on site include the growing of Indium Phosphide (InP) and Gallium Phosphide (GaP) crystals.

General Occupational Hazards associated with the manufacture of Semiconductor Materials, principally Gallium Arsenide

1. **Arsenic Hazard.** Metallic arsenic is used as a raw material in the production of gallium arsenide (GaAs) wafers. Arsenic, as well as inorganic compounds of arsenic - such as polysynthesized gallium arsenide, are characterized as either known or suspect human carcinogens. Potential routes of exposure include inhalation of airborne dust or finely divided particulate, absorption of certain inorganic forms through the skin, ingestion, and/or exposure and entry via contact with skin or eyes. Symptoms of exposure may include ulceration of the nasal septum, dermis or skin, gastrointestinal disturbances, damage to the peripheral nervous system, respiratory irritation, alteration of normal pigmentation of the skin, and cancer. Adverse systemic effects of exposure can affect the liver, kidneys, skin, lungs, and lymphatic system. Additionally, inorganic arsenic is listed and regulated under The Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) as a carcinogen and reproductive toxin.

2. **Chemical Hazards.** Various chemicals are also used as cleaners in wafer production. Chemicals posing a potential for acute hazard upon exposure are most widely used in two departments: polysynthesis and in clean room operations. The chemicals commonly used at American Xtal Technology include:

- acetic acid (80% aqueous)
- ammonium hydroxide(30 % aqueous)
- bromine (small quantities, 400 ml bottles)
- hydrogen peroxide (30% concentration)
- methanol (99% concentration)
- nitric acid (70% aqueous)
- hydrochloric acid (38% aqueous)
- hydrofluoric acid (52% aqueous)
- phosphoric acid (70% aqueous)
- sulfuric acid (95% concentration)
- SVC-27 (citrus degreaser)
- coolant (which contains organic amines)
- metallic arsenic
- metallic gallium

Hydrogen peroxide and ammonium hydroxide are typically mixed (diluted) with de-ionized (DI) water for cleaning "glass boats" Hydrochloric, hydrofluoric and nitric acids are used in varying concentrations to clean or etch glassware. Hydrochloric and nitric are

mixed to form a product called aqua regia to clean glassware. Hydrofluoric is used in lesser concentrations to etch quartz. Bromine is used to etch seed crystals used in crystal growth. Methanol is a flammable solvent used in crystal growth for removing GaAs crystals from crucibles. Aqueous wastes are "consumed" in pretreatment (neutralization) of the industrial waste water discharge. Waste organics (such as waste methanol and SVC-27 degreaser) are managed in accordance with Title 22 of the California Code of Regulations and are handled and disposed of as manifested hazardous waste.

For a complete list of historically inventoried chemicals at this site, please refer to American Xtal Technology's Hazardous Materials Management Plan (HMMP), which is on file with the Alameda County Department of Environmental Health, Hazardous Materials Division, 80 Swan Way, Room 200, Oakland, CA 94621.

3. Pretreatment of Industrial Waste Water. American Xtal Technology is a conditionally permitted pretreatment facility for batch recovery of soluble and insoluble inorganic arsenic from process waste water, as well as the pH neutralization of aqueous acid and base solutions. American Xtal Technology maintains a fully executed Industrial Waste Water Discharge Permit (#95032) with the Dublin San Ramon Services District. (DSRSD), Industrial Waste Section, 7399 Johnson Drive, Pleasanton, CA 9588. American Xtal Technology's record with DSRSD demonstrates a history of substantial compliance with local, state, and federal regulations.

4. Disposal of Hazardous Wastes. Various process waste streams containing inorganic (arsenic or gallium arsenide) are managed and disposed of as hazardous wastes. Principal waste streams include:

Filter-cake, which is profiled as an arsenic-containing, non-RCRA waste and goes to an approved landfill in accordance with Title 22, California Code of Regulations (CCR), requirements, is a mixture of recovered suspended solids and arsenic from pretreated waste water.

Hazardous Waste, Solids, N.O.S., debris contaminated with gallium arsenide, NA 3077, PG III, which is profiled as a RCRA waste, and is handle, treated/stabilized, and disposed of in accordance with Title 22, California Code of Regulations (meeting the requirements of 42 U.S.C. Section 6901 et. seq., federal RCRA).

Waste Combustible Liquid, N.O.S. (aliphatic hydrocarbons), NA1993, PG III, SVC-27 degreaser, which is profiled as a California hazardous waste.

Waste Methanol, 3, UN1230, PGII, RQ (D001), waste methanol which is profiled as a RCRA waste and goes for incineration.

American Xtal Technology maintains a record (copies of all hazardous waste manifests) of the nature, manner of transport, and disposition of all regulated wastes shipped from the Dublin site since its inception.

Current Operational Status of the Facility

At present the facility is occupied by a work team of two individuals who are engaged in non-production, research and development (R&D) of Indium Phosphide and Gallium Phosphide crystals.

Gallium arsenide production operations were relocated to our new Fremont, California facility in June of 1996. Over the intervening period, the site has served as a operational area for R&D work, and warehouse storage of equipment for the Fremont Facility, which is undergoing expansion.

Current Chemical Inventory

On March 24, 1997 an inventory of chemicals stored on site was made. **Exhibit A** provides an overview of chemical stock on hand which is available for current R&D purposes and/or which will be reshipped to Fremont as part of the site closure protocol. **Exhibit B** provides an overview of chemical wastes which will be profiled, manifested, and shipped off for appropriate disposal also as a part of the site closure protocol. American Xtal Technology will utilize the services of Rollins Environmental to label, manifest, transport, treat, and dispose of these wastes per state and/or federal environmental regulations.

Site Assessment and Development of a Remediation Strategy and Plan

The primary concern that American Xtal Technology has with respect to closure of the Dublin facility is the decontamination, or removal, of inorganic arsenic from all structural elements or work surfaces of the facility. All process related piping, containers, tanks, vessels, ductwork, LEV blowers, pollution abatement scrubbers, spill enclosures (i.e., concrete berm in waste treatment area) will be removed from the facility as a part of the closure protocol. Items with economic value will be retained for reuse in Fremont. Waste materials will be disposed of.

The general cleanup strategy for non-process related elements (floors, walls, ceilings, etc.) is two tiered: The Tier I strategy involves surface decontamination or cleaning. The Tier II strategy involves removal of contaminated materials, which are either not amenable to cleaning (for example by means of HEPA vacuuming, detergent wet cleaning, or other suitable methodology) or for which available methods prove ineffective. Items such as carpeting, stained drywall, stained or dirty ceiling tiles in process areas, which demonstrate detectable contamination will be targeted for removal from the facility. Wastes generated in the decontamination and closure operation will be profiled and managed as required by Title 22, California Code of Regulations. Streams of waste which test as RCRA waste

will be disposed of at Chemical Waste Management, Inc.'s Class 1 Landfill at Kettleman City, California. Non-RCRA waste will be disposed of at Waste Management, Inc.'s Class 2 Landfill at Altamont, California.

As required by environmental regulation, American Xtal Technology will attempt to minimize the amount of regulated waste that it generates in this closure process. To the extent practicable, the cleanup strategy will include an attempt to clean or remove inorganic arsenic contamination from waste materials where these materials can be disposed of as ordinary construction debris. One material in particular which may offer some promise of decontamination is local exhaust ventilation ductwork, which may be amenable to cleaning. In contrast, we do not anticipate any advantage either in terms of waste minimization or waste reclassification in trying to clean or decontaminate items like waste stream or process piping. Equipment intended for reuse (air pollution control equipment [scrubber], storage tanks or vessels, the waste treatment filter press) will be decontaminated to the extent possible prior to transport to our Fremont facility. To prevent inadvertent exposure to "movers", process equipment, which can not be thoroughly decontaminated, will be wrapped in polyethylene sheeting and marked with precautionary labels (Refer to 8 CCR 5214 (I) Signs and Labels. Legend: Danger, contains Inorganic Arsenic, Cancer Hazard, prior to handling and shipment by personnel without hazardous materials training.

Facility cleanup and decontamination will be performed under contract by a hazardous materials abatement company. The cleanup plan will involve the establishment of specific work areas for cleanup and decontamination. Procedures may vary according to the degree of contamination seen. Established work areas will be isolated from surrounding environments using polyethylene sheeting, critical barriers, and high efficiency particulate air (HEPA) filtration units for engineering control of airborne dust and particulates. Worker will wear full-body disposable "tyvek" coveralls (or equivalent), protective gloves, and half-face air-purifying respirators equipped with HEPA filters for all work activities which may expose workers to either inorganic arsenic, or in the case of removal of certain floor tiles and mastic, airborne asbestos fibers. The contractor will set up a decontamination facility on site to permit showering upon exit of any regulated areas. Hygiene facilities and practices shall conform to the requirements of the General Industry Standard for occupational exposure to inorganic arsenic, 8 CCR 5214. Work involving the removal of asbestos containing floor tile and mastic will be conducted in accordance with California Construction Safety Orders, 8 CCR 1529, Asbestos. All work performed by the hazardous materials abatement contractor on site will be performed in accordance with Title 8, California Code of Regulations.

The types of decontamination techniques employed in the closure protocol will likely involve a combination of approaches, including: HEPA vacuuming, wet wiping of impermeable surfaces, and other suitable techniques (such as those prescribed for other types of heavy metals abatement, e.g. lead). Care will be taken in using wet methods so as not to "inbed" inorganic arsenic in porous surfaces (such as the concrete slab) that are to remain.

Bulk Sampling For Asbestos

The first tiered-response to site cleanup, as mention earlier, is decontamination or cleaning. The second tiered-response, where cleaning fails to be effective or is impractical, is material removal. Because the disturbance of certain building materials may pose the potential for disturbance of asbestos, sampling was conducted to anticipate the potential impact that removal of certain building materials might pose on cleanup activities. EPA AHERA (Asbestos Hazard Emergency Response Act) sampling rules were applied in assessing the asbestos content of floor tiles, floor mastic or adhesive, sheet vinyl, drywall, drywall joint compound, texturized coating over drywall, and acoustical ceiling tiles.

Asbestos sampling results are found in **Exhibit C**. Results indicate the presence of asbestos in one type of 12" floor tile, and its mastic, found within the facility. The accompanying floor plan, in this exhibit, shows the ground floor locations of this material in the facility. Additionally, this type of floor tile is also found in a 2nd floor lunchroom. Please note that we have assumed that flooring materials in 1st and 2nd floor rest rooms, the former polishing area, and the clean room will not require removal. Thus, these materials were not tested. All other materials, drywall, drywall texture, drywall joint compound, acoustical ceiling tiles, sheet vinyl, and floor tile tested "negative" for asbestos by polarized light microscopy (PLM).

Bulk samples for asbestos were collected by a State of California Certified Asbestos Consultant (Certification No. 92-0853, Expiration 1/15/98) and were analyzed via polarized light microscopy (PLM) by Microanalytical Laboratories of Emeryville, California, an accredited state and national (National Institute of Standards and Technology - NIST) laboratory for analysis of bulk samples for asbestos determination.

Wipe Sampling for Inorganic Arsenic

To assess the extent and degree of surface contamination of inorganic arsenic at the facility, American Xtal Technology conducted wipe sampling of various surface areas where, due to the nature of past operations, contamination was suspected. Twenty five wipe samples were collected. Laboratory analysis was performed using ion-coupled atomic emission spectroscopy (ICP). Samples were analyzed by Clayton Environmental of Pleasanton, California, which is certified by the California Department of Health Services (DOHS) for Hazardous Waste Testing. Clayton Environmental is also nationally accredited by the American Industrial Hygiene Association.

Wipe Sampling for Inorganic Arsenic (continued)

Results showed levels of inorganic arsenic on various surfaces as follows:

- Floors: 0.007 mg/100 cm² (“clean area”) to 16 mg/100 cm² (“dirtiest area”)
- Walls: 0.026 mg/100 cm² (“dirty area”) to 5.9 mg/100 cm² (“dirtiest area”)
- Ceiling or above ceiling line (8') fixtures (exposed):
1.3 mg/100 cm² (slicing) to 3.5 mg/100 cm² (grinding)
- Ceiling or above ceiling line (8') fixtures (unexposed):
0.04 mg/100 cm² (safety office) to 0.42 mg/100 cm² (main office)
- Roof top LEV Motor Mount:
0.10 mg/100 cm² (unit serves annealing)
- Roof top LEV (inside discharge):
20 mg/100 cm² (highest concentration detected)

Complete results are summarized in Exhibit D.

Inorganic Arsenic in Bulk Samples of Carpeting

In addition to wipe samples, American Xtal Technology also collected bulk samples of carpeting from various areas of suspected contamination. Bulk samples were analyzed to achieve a Total Threshold Limit Concentration (TTLC) for each respective sample. Concentrations are reported on a weight basis in mg/kg. Analysis was performed by Clayton Environmental using ion-coupled plasma atomic emission spectroscopy (ICP). The results for inorganic arsenic in carpeting are as follows.

- Carpet (blue) - Main Office: 420 mg/kg
- Carpet (blue) - Safety Office: 360 mg/kg
- Carpet (brown) - 2nd Floor: 86 mg/kg

The data demonstrate detectable levels of inorganic arsenic contamination in this carpeting. The levels appear to reflect the likelihood of contamination based on predictable levels of foot traffic and general proximity to areas of production. The data also indicate the need for cleaning or removal of these materials as part of the closure

protocol. Applying a "rule of thumb" for conversion of this data to TCLP or STLC parameters. Carpeting is not likely to be classified as a RCRA waste, but rather as a non-RCRA waste requiring, in the absence of specific additional testing, disposal at a permitted landfill.

For detailed information about these samples refer also to Exhibit E.

Bulk Samples of Local Exhaust Ventilation Ductwork For Waste Profiling

The final set of samples, which American Xtal Technology has collected, is a set of 6 bulk sheet metal samples (approx. 100 grams per sample), which were taken from local exhaust ventilation (LEV) ducting in five production areas (Polysynthesis, Crystal Growth, Grinding, Cutting, and Annealing). From earlier wipe sampling, it was evident that visible accumulation of particulate on LEV systems at roof exhausts (see roof unit for annealing) could test positive for inorganic arsenic at a concentration of about 20 mg/100 cm² or about 500 ppm on a weight basis (calculation made as follows: 20 mg of inorganic arsenic/100 cm² of surface area; and 100 cm² section of standard gauge duct weighing about 39 grams). In anticipation that this material would be disposed of as an arsenic-contaminated waste, American Xtal Technology collected bulk samples of ducting for federal RCRA characterization. Samples were submitted to Clayton Environmental Laboratories of Pleasanton, California and were analyzed via the EPA's prescribed test methodology (Toxic Characteristic Leachate Procedure, or TCLP) for arsenic. In general sampling locations were at the "front end" of the LEV system, which was proximate to the process source of the "emission" and accessible. Test results indicate LEV waste is non-RCRA waste. (TCLP <5 mg/L) The results are as follows:

- | | |
|-----------------------------|-----------|
| • Crystal Growth, 8" LEV | 0.3 mg/L |
| • Crystal Growth, 10" LEV | <0.3 mg/L |
| • Polysynthesis, Hood Inlet | <0.3 mg/L |
| • Grinding, 10" LEV | 1.3 mg/L |
| • Cutting, 10" LEV | <0.3 mg/L |
| • Annealing, 10" LEV | <0.3 mg/L |

For a detailed summary of these results refer to **Exhibit F**.

Anticipated Scope of Work Relating to Facility Closure

The following is a list of work tasks, under three categories, which will be performed as a part of the closure protocol:

Category I - General Facilities Issues:

1. American Xtal Technology will need to schedule and move (via a commercial mover) newly acquired equipment, which is currently warehoused at this site, to an alternate storage space. This is equipment which has never been used at Dublin. It is part of

new production that will be set up in Fremont following completion of a facility expansion there in the second half of 1997. It remains in its original packaging, or packing, condition.

2. American Xtal Technology will also need to disassemble, pack, and move (again with the help of a commercial mover) R&D and support equipment used for growth and development of Indium Phosphide (InP) and Gallium Phosphide (GaP) crystals. Because the materials used in these products lines are not hazardous (i.e., they do not pose the exposure concerns that are associated with inorganic arsenic in the manufacturer of Gallium Arsenide (GaAs)). The move involving this equipment is considered routine in nature. A basic description of equipment associated with InP and GaP operations would include: high pressure, high temperature vessels used to grow crystals under an inert atmosphere; process controllers, furnaces, ovens, some shop equipment (e.g., drill press, grinding wheels, and the like), an overhead crane, and equipment staging platforms and structures.
3. American Xtal Technology will also need to schedule the return of the remaining quantity of compressed gas cylinders (1 or 2 bottles of Hydrogen (200 cf units) and approximately 8-10 bottles of Argon) that have been used routinely to support R&D operations, to their vendor, Air Products.

Category II - Handling of Chemical Inventory and Hazardous Waste Disposal:

1. Exhibit A, of this document provides a list, with quantities, of current chemical stock on hand at the Dublin facility. Materials with economic value will be moved in accordance with DOT shipping requirements to our Fremont facility as part closure. Off "spec" materials or materials with limited application in Fremont (i.e. paints, oils, cements, etc.) will be disposed of.
2. Exhibit B summarizes chemical or hazardous wastes which are currently stored in our chemical waste storage area. The disposition of these materials, wastes previously generated from known process streams, will be labeled, manifested, shipped, treated and disposed of, per Title 22 requirements, utilizing the assistance of Rollins Environmental.

Category III Facility Cleaning - Decontamination and/or Removal of Inorganic Arsenic Contaminated Facility Elements:

The following list provides an abbreviated summary of the anticipated scope of work by the hazardous materials abatement contractor in cleaning, or decontaminating, the site of inorganic arsenic. The work will involve, in general, the cleaning and/or removal of contaminated building materials (flooring, drywall, drop ceilings, concrete berm(s) used for secondary containments of process related solutions), process piping (vacuum lines, compressed air lines, DI water supply lines, as well as process waste and drain lines), local

exhaust ventilation ducting, chemical hoods, dismantling and removal of a roof top chemical scrubber. The estimated scope in terms of quantity take-offs is as follows:

- Removal/disposal of approximately 1,444 lineal feet of duct under 17" diameter
- Removal/disposal of approximately 200 lineal feet of duct over 17" diameter
- Removal/disposal of approximately 1,741 square feet of acoustical ceiling
- Removal/disposal of approximately 3,094 square feet of drywall
- Removal/disposal of approximately 1,027 lineal feet of process piping
- Removal/disposal of approximately 2,685 square feet of floor tile
- Removal/disposal of approximately 1,466 square feet of sheet vinyl/floor tile
- Removal/disposal of approximately 2,234 square feet of **Asbestos** floor tile
- Removal/disposal of approximately 140 square feet of sheet vinyl
- Removal/disposal of approximately 253 square feet of concrete
- Removal 7 roof top exhaust systems
- Removal 16 chemical hoods
- Dismantling and removal of 1 roof top chemical scrubber

Post-Abatement Clearance Sampling

To demonstrate the effectiveness of the cleanup activity undertaken, American Xtal Technology, in conjunction with its hazardous materials abatement contractor, and B&G Management, the property owners, will perform follow up testing (wipe sampling of facility elements/surfaces, and post asbestos removal air sampling) to validate the effectiveness of cleanup activity in removing trace levels of inorganic arsenic from the facility. Without describing specifics here and now, the post-assessment sampling strategy for inorganic arsenic will be similar in nature and scope to testing performed initially. Intermediate stage testing is anticipated as a means for gauging the effectiveness of decontamination techniques that will be undertaken.

List of Parties to be Kept Apprised of the Process

1. Ms. Madulla Logan
Hazardous Materials Specialist
Alameda County Health Agency
Division of Environmental Protection
Dept. of Environmental Health
1131 Harbor Bay Parkway, 2nd Floor
Alameda, Ca 94502 Tel. 510-567-6764

2. Mr. Erik Keufner
Industrial Waste Inspector II
Dublin San Ramon Service District
Regional Waste Water Treatment Facility
7399 Johnson Drive
Pleasanton, CA 94588 Tel. 510-846-0568 Ext. 128

3. Mr. Bob Snodgrass
Dougherty Regional Fire Authority
9399 Fircrest Lane
San Ramon, CA 94583 Tel. 510-803-8603


4. B&G Management
2520 College Avenue
Berkeley, CA, 94704 Tel.. 510-848-3608

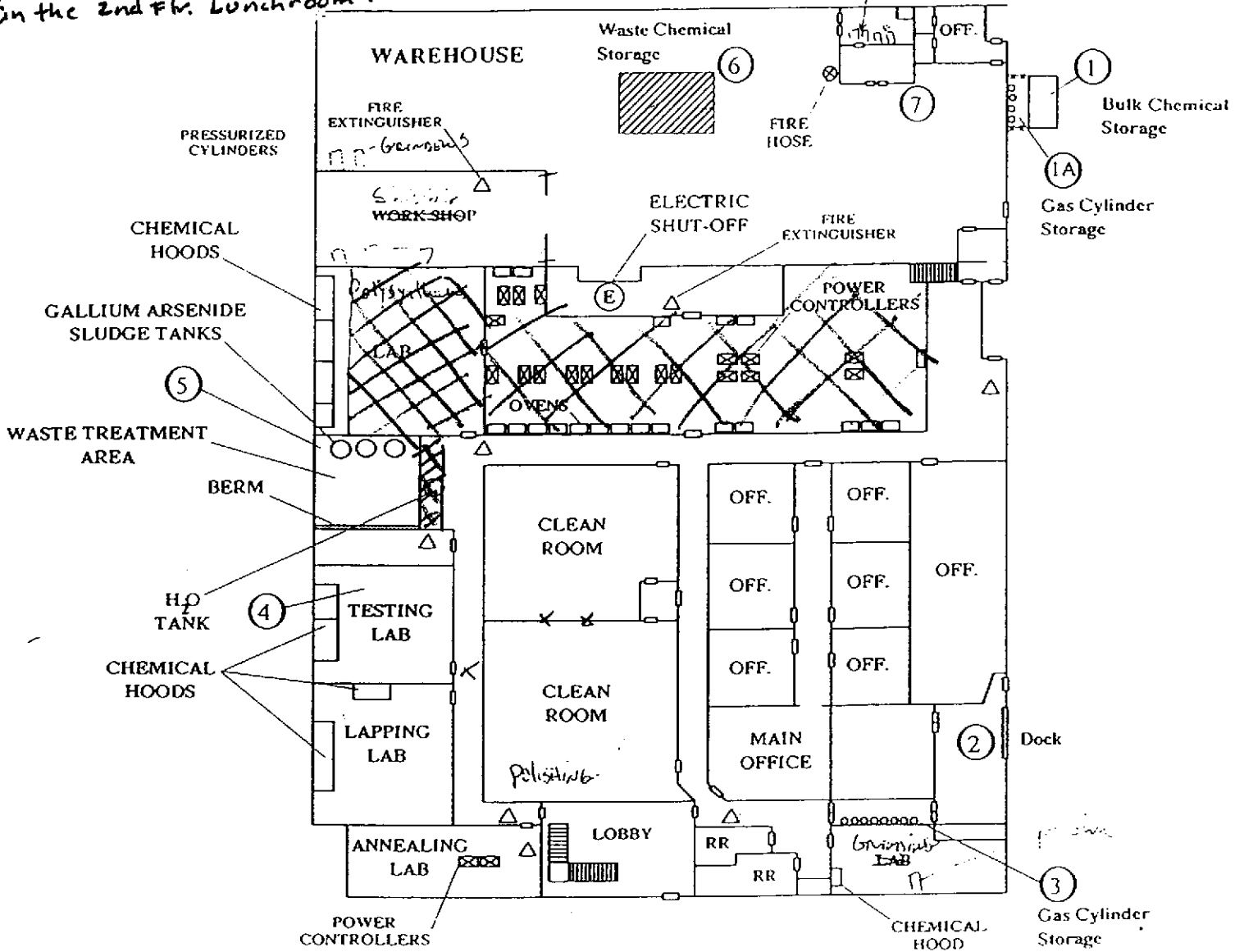
AXT - Dublin
Stock Chemical Inventory
March 24, 1997

CHEMICAL	No. of Containers	Container Size	Amount
Acetone	3	1 gal	1 gal
Alumina powder	1	1 gal	1/4 gal
Ammonium hydroxide	1	1 gal	1/4 gal
Ammonium hydroxide	2	1 gal	1 gal
Ammonium hydroxide	2	1 gal	1 gal
Ammonium hydroxide (marked as)	1	1 gal	1 gal
Antifreeze	1	1 gal	1 gal
Argon	6	280 cf	
Argon (inside storage)	8	280 cf	full
Ferric Chloride	1	55 gal	25 gal
Ferric Chloride	5	1 gal	1 gal
Fisher buffer soln 4.00	1	500 ml	500 ml
Fujimi (PO7438 T. Hunt) adrasive powder (green)	2	boxes	
gallium arsenide (waste wafers)	1	5 gal	2 gal
HB+Phosphoric	1	1 gal	1 gal
Hydrogen	1	200 cf	full
Hydrogen	1	200 cf	
Hydrogen peroxide	1	1 gal	1 gal
Hydrogen peroxide	1	1 gal	1 gal
Hydrogen peroxide	11	1 gal	10.5 gal
Hydrogen peroxide	1	1 gal	0.5 gal
Jasco Adhesive Remover	1	1 gal	1 gal
Leybold Vacuum Oil	1	1 quart	1 quart
Lithium hypochlorite	1	25#	12#
Nitrogen (inside storage)	2	200 cf	full
Oately Cement	0	16 oz	16 oz
Oately Purple Primer	1	8 oz	8 oz
Omega Bond Epoxy Resin	1	16 oz	16 oz
Oxygen	1	255 cf	
Paint	2	1 gal	2
Phosphoric acid	1	1 gal	1 gal
Potassium Permanganate (solid)	1	500 g	500 g
Sodium bicarbonate	1	50#	25#
Sodium hydroxide (solid - 2.5 kg)	1	2.5 kg	0.6 kg
SolvOil Kerosene	1	1 gal	1/2 gal
Sulfuric acid	1	1 gal	1 gal
Sulfuric acid waste	1	500 ml	500 ml
Summa Clean	3	1 gal	2.5 gal
SVC 27	1	1 gal	1/4 gal
SVC 27	1	1 gal	1 gal
Tetrahydrofuran	1	1 gal	1 gal
Vacuum Oil (methanol containers)	2	1 gal	1 gal
WD40	2	1 gal	1 gal

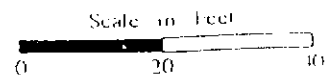
AXT - Dublin
Inventory of Waste
Chemicals for Disposal
April 17, 1997

CHEMICAL	HAZWaste	No. of Containers	Container Size	Amount	Area	Waste Category	Description
Blue half poly drums (hazwaste stickers)	Y	2	25 gal	empty	1	empty container	
Evercoat Polyester Resin	Y	1	1 gal	1 gal	1	Lab Pack of harden & dispose	
Fiberglass Resin (Fibre Glass-Evercoat)	Y	1	1 gal	1 gal	1	Lab Pack of harden & dispose	
Filter cake (waste)	Y	1	55 gal	25 gal	8	non-RCRA	Filter Press Cake, Non-RCRA hazardous Waste Solid, 171/181/491
Fujimi Cut WS (Oil)	Y	1	2 gal	2 gal	1	?	
Fujimi tapping oil (wire saws) Gallium arsenide contamination #Italy	Y	1	55 gal	55 gal	1	Test for RCRA Class	Hazardous Waste Solid, N.O.S., 9, NA 3077, PG III (gallium arsenide, metal oxides)
Hydrofluoric acid (waste) from Polysynthesis (As)	Y	1	80 gal.	20 gal.	1	D002,D004 (Possible RCRA As?)	Hydrofluoric acid, solution (<80%), 8, UN1790, PGII, corrosive, poison
Kerosene	Y	1	5 gal	1.8 gal	1	Possible Recycle Evergreen	
Kerosene (used)	Y	1	5 gal	1 gal	1	Possible Recycle Evergreen	
Liquid Hardener (Polyester Resin)	Y	1	40 ml	5 ml	1	Lab Pack of harden & dispose	
Methanol	Y	1	1 gal	1 gal	1	D001/F003/214	Waste Flammable Liquids, N.O.S. (methanol), 3, UN1993, PGII, RQ (D001)
Methanol (waste)	Y	8	1 gal	8 gal	8	D001/F003/214	Waste Flammable Liquids, N.O.S. (methanol), 3, UN1993, PGII, RQ (D001)
Methanol (waste)	Y	1	1 gal	1 gal	8	D001/F003/214	Waste Flammable Liquids, N.O.S. (methanol), 3, UN1993, PGII, RQ (D001)
Oil (unknown) Park sung containers	Y	2	1 gal	1 gal	1		
Sulfuric acid	Y	1	55 gal	empty	1	empty container	
Sulfuric acid (haz waste label) GaAs wafer etchant	Y	1	55 gal	55 gal	1	D002,D004 (Possible RCRA As?)	Sulfuric Acid (95%), 8, UN1830, PGII, Corrosive (55 gal, poly E)
SVC-27 Degreaser (aliphatic hydrocarbons and food grade terpene hydrocarbon	Y	1	55 gal	55 gal	1	State Waste Code 214	Waste Combustible Liquid, N.O.S., Combustible Liquid, NA 1993, PG III
Waste oil (in methanol container?)	Y	1	1 gal	1 gal	1		
Wire saw waste wire	Y	1	55 gal	55 gal	1	D004/181	Hazardous Waste Solid, NOS, NA3077, PG III (D004/181) (gallium arsenide)

 marks location of asbestos F.T. + matrix.
 This doesn't include ACM floor tile in the 2nd Flr. Lunchroom.



AMERICAN XTAL TECHNOLOGY
 6780 SIERRA COURT
 DUBLIN, CALIFORNIA 94568
 "SITE MAP" - MAIN BUILDING



Date November 17, 1994

1004

American Xtal Technology
4311 Solar Way
Fremont, CA 94538

43216

510-683-5900 (voice)
510-683-5901 (fax)

Submit Results to:
ATTN: Ed Haggerty

(Flooring)
Areas cited
Test: Rest rooms
2nd Flr.:
Rest rooms & 1st
Flr.

Submit to: Microanalytical Laboratories
5900 Hollis Street, Suite M
Emeryville, CA 94608

Analyze for asbestos by PLM

Sample No.	Description
1	Sheet vinyl, Sawing, beige, stone pattern
2	Sheet vinyl, Sawing, restore, 4" square pattern
3	Texture to drywall, Safety Office Area
4	Drywall Joint Compound, Sawing Area
5	Drywall Joint Compound, Entry to Crystal Growth
6	Texture to drywall, Crystal Growth
7	Texture to drywall, Utilities Room
8	12" VCT, brownish red, Crystal Growth
9	Mastic (Black tar) to sample 8
10	12" VCT, brownish red, Polysynthesis
11	Mastic (Black tar) to sample 10
12	Texture to drywall, Polysynthesis
13	Drywall, Polysynthesis/Crystal Growth
14	12" VCT (Gray-coated, same as hallway) Waste Area
15	Mastic (Black tar) to sample 14
16	Texture to drywall, Lapping
17	Drywall, Lapping
18	2'x4' cellulose ceiling tile, Annealing (older)
19	Drywall, Annealing
20	Texture to drywall, Annealing
21	2'x4' cellulose ceiling tile, Annealing (newer)
22	2'x4' cellulose ceiling tile, Main Office (typical)
23	Texture to drywall, Grinding Area
24	Drywall Joint Compound, Grinding Area
25	Tape to Drywall, Grinding
26	Drywall, Grinding
27	Texture to drywall, 2nd Flr. Chase above annealing
28	Drywall joint compound, 2nd Flr. Chase above annealing
29	Drywall, 2nd Flr. Chase above annealing
30	Texture to drywall, 2nd Flr. Chase above Cleanroom
31	Drywall joint compound, 2nd Flr. Chase above Cleanroom
32	Drywall, 2nd Flr. Chase above Cleanroom
33	Texture to drywall, 2nd Flr. Chase above Polysynthesis
34	Drywall Joint compound, 2nd Flr. Chase above Polysynthesis
35	Drywall, 2nd Flr. Chase above Polysynthesis
36	2'x4' cellulose ceiling tile - 2nd floor, chase above annealing

Additional
Areas: ①
Beneath DT
water unit;
② Lunch room
(2nd Flr).

Received for Micro Analytical Labs
4-2-97, 1063

MICRO ANALYTICAL LABORATORIES, INC. POLARIZED LIGHT MICROSCOPY

1004
American Xtal Technology
4311 Solar Way
Fremont, CA 94538

PROJECT:
NOT GIVEN

Date Sampled 3/31/96
Date Received 4/2/97
Total Samples 36
Micro Log In 43216

SAMPLE INFORMATION	ASBESTOS MINERALS		NON ASBESTOS FIBERS		NON FIBROUS MATRIX	
	PERCENT	TYPE	PERCENT	TYPE	PERCENT	TYPE
Client: <u>1</u> Micro: 43216-01 Analyst: QH SHEET VINYL, SAWING, BEIGE, STONE PATTERN	ND		25 10	CELLULOSE FIBROUS GLASS	65	SYNTHETIC MATERIAL, MISC. PARTICLES.
Client: <u>2</u> Micro: 43216-02 Analyst: QH SHEET VINYL, SAWING, RESTORE, 4" SQUARE PATTERN	ND		25 5	CELLULOSE FIBROUS GLASS	70	SYNTHETIC MATERIAL, MISC. PARTICLES.
Client: <u>3</u> Micro: 43216-03 Analyst: QH TEXTURE TO DRYWALL SAFETY OFFICE AREA	ND		ND		100	QUARTZ, OPAQUES, MISC. PARTICLES.
Client: <u>4</u> Micro: 43216-04 Analyst: QH DRYWALL JOINT COMPOUND SAWING AREA	ND		ND		100	QUARTZ, OPAQUES, CALCITE, MISC. PARTICLES.
Client: <u>5</u> Micro: 43216-05 Analyst: QH DRYWALL JOINT COMPOUND ENTRY TO CRYSTAL GROWTH	ND		ND		100	QUARTZ, OPAQUES, CALCITE, MISC. PARTICLES.

Technical Supervisor:  4/2/97
Gary Yianping Li, Ph. D.

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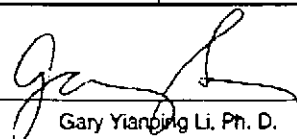
MICRO ANALYTICAL LABORATORIES, INC. POLARIZED LIGHT MICROSCOPY

1004
American Xtal Technology
4311 Solar Way
Fremont, CA 94538

PROJECT:
NOT GIVEN

Date Sampled 3/31/96
Date Received 4/2/97
Total Samples 36
Micro Log In 43216

SAMPLE INFORMATION	ASBESTOS MINERALS		NON ASBESTOS FIBERS		NON FIBROUS MATRIX	
	PERCENT	TYPE	PERCENT	TYPE	PERCENT	TYPE
Client: <u>6</u> Micro: 43216-06 Analyst: QH TEXTURE TO DRYWALL CRYSTAL GROWTH	ND		ND		100	QUARTZ, OPAQUES, CALCITE, MISC. PARTICLES.
Client: <u>7</u> Micro: 43216-07 Analyst: QH TEXTURE TO DRYWALL UTILITIES ROOM	ND		ND		100	QUARTZ, OPAQUES, CALCITE, MISC. PARTICLES.
Client: <u>8</u> Micro: 43216-08 Analyst: QH 12" VCT BROWNISH RED CRYSTAL GROWTH	2	CHRYSOTILE	ND		98	CALCITE, VINYL, MISC. PARTICLES.
Client: <u>9</u> Micro: 43216-09 Analyst: QH MASTIC (BLACK TAR) TO SAMPLE 8	5	CHRYSOTILE	ND		95	TAR, QUARTZ, MISC. PARTICLES.
Client: <u>10</u> Micro: 43216-10 Analyst: QH 12" VCT BROWNISH RED POLYSYNTHESIS	2	CHRYSOTILE	ND		96	CALCITE, VINYL, MISC. PARTICLES.

Technical Supervisor:  4/2/97
Gary Yianping Li, Ph. D.

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MICRO ANALYTICAL LABORATORIES, INC. POLARIZED LIGHT MICROSCOPY

1004
American Xtal Technology
4311 Solar Way
Fremont, CA 94538

PROJECT:
NOT GIVEN

Date Sampled 3/31/96
Date Received 4/2/97
Total Samples 36
Micro Log Id 43216

SAMPLE INFORMATION	ASBESTOS MINERALS		NON ASBESTOS FIBERS		NON FIBROUS MATRIX	
	PERCENT	TYPE	PERCENT	TYPE	PERCENT	TYPE
Client: 11 Micro: 43216-11 Analyst: QH MASTIC (BLACK TAR) TO SAMPLE 10	5	CHRYSOTILE	ND		85	TAR, CALCITE, MISC. PARTICLES.
Client: 12 Micro: 43216-12 Analyst: QH TEXTURE TO DRYWALL POLYSYNTHESIS	ND		ND		100	GYPSUM, CALCITE, MISC. PARTICLES.
Client: 13 Micro: 43216-13 Analyst: QH DRYWALL POLYSYNTHESIS/CRYSTAL GROWTH	ND		15	CELLULOSE	85	GYPSUM, MISC. PARTICLES.
Client: 14 Micro: 43216-14 Analyst: QH 12" VCT (GRAYCOATED SAME AS HALLWAY) WASTE AREA	ND		ND		100	CALCITE, VINYL, MISC. PARTICLES.
Client: 15 Micro: 43216-15 Analyst: QH MASTIC (BLACK TAR) TO SAMPLE 14	ND		ND		100	SYNTHETIC MATERIAL, MISC. PARTICLES.

Technical Supervisor:  4/2/97

Gary Yianping Li, Ph. D.

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MICRO ANALYTICAL LABORATORIES, INC. POLARIZED LIGHT MICROSCOPY

1004
American Xtal Technology
4311 Solar Way
Fremont, CA 94538

PROJECT:
NOT GIVEN

Date Sampled 3/31/96
Date Received 4/2/97
Total Samples 36
Micro Log In: 43216

SAMPLE INFORMATION	ASBESTOS MINERALS		NON ASBESTOS FIBERS		NON FIBROUS MATRIX	
	PERCENT	TYPE	PERCENT	TYPE	PERCENT	TYPE
Client: 16 Micro: 43216-16 Analyst: QH TEXTURE TO DRYWALL LAPPING	ND		ND		100	CALCITE, QUARTZ, MISC. PARTICLES.
Client: 17 Micro: 43216-17 Analyst: QH DRYWALL LAPPING	ND		10	CELLULOSE	90	GYPSSUM, MISC. PARTICLES.
Client: 18 Micro: 43216-18 Analyst: QH 2'X4' CELLULOSE CEILING TILE ANNEALING (OLDER)	ND		20 25	FIBROUS GLASS CELLULOSE	55	PERLITE, CALCITE, QUARTZ, MISC. PARTICLES.
Client: 19 Micro: 43216-19 Analyst: QH DRYWALL ANNEALING	ND		20	CELLULOSE	80	GYPSSUM, MISC. PARTICLES.
Client: 20 Micro: 43216-20 Analyst: QH TEXTURE TO DRYWALL ANNEALING	ND		ND		100	CALCITE, OPAQUES, MISC. PARTICLES.

Technical Supervisor:  4/2/97

Gary Yianping Li, Ph. D.

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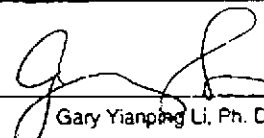
1004
American Xtal Technology
4311 Solar Way
Fremont, CA 94538

PROJECT:
NOT GIVEN

Date Sampled 3/31/96
Date Received 4/2/97
Total Samples 36
Micro Log In: 43216

SAMPLE INFORMATION	ASBESTOS MINERALS		NON ASBESTOS FIBERS		NON FIBROUS MATRIX	
	PERCENT	TYPE	PERCENT	TYPE	PERCENT	TYPE
Client: <u>21</u> Micro: 43216-21 Analyst: QH 2'X4' CELLULOSE CEILING TILE ANNEALING (NEWER)	ND		20 25	CELLULOSE FIBROUS GLASS	55	PERLITE, CALCITE, MISC. PARTICLES.
Client: <u>22</u> Micro: 43216-22 Analyst: QH 2'X4' CELLULOSE CEILING TILE MAIN OFFICE (TYPICAL)	ND		20 25	CELLULOSE FIBROUS GLASS	55	PERLITE, CALCITE, MISC. PARTICLES.
Client: <u>23</u> Micro: 43216-23 Analyst: QH TEXTURE TO DRYWALL GRINDING AREA	ND		ND		100	CALCITE, PAINT, MISC. PARTICLES.
Client: <u>24</u> Micro: 43216-24 Analyst: QH DRYWALL JOINT COMPOUND GRINDING AREA	ND		ND		100	CALCITE, QUARTZ, MISC. PARTICLES.
Client: <u>25</u> Micro: 43216-25 Analyst: QH TAPE TO DRYWALL GRINDING	ND		80	CELLULOSE	20	CALCITE, MISC. PARTICLES.

Technical Supervisor: _____



4/2/97

Gary Yianping Li, Ph. D.

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MICRO ANALYTICAL LABORATORIES, INC. POLARIZED LIGHT MICROSCOPY

1004
American Xtal Technology
4311 Solar Way
Fremont, CA 94538

PROJECT:
NOT GIVEN

Date Sampled 3/31/96
Date Received 4/2/97
Total Samples 36
Micro Log In 43216

SAMPLE INFORMATION		ASBESTOS MINERALS PERCENT TYPE	NON ASBESTOS FIBERS PERCENT TYPE	NON FIBROUS MATRIX PERCENT TYPE
Client: <u>26</u> Micro: 43216-26 Analyst: QH DRYWALL GRINDING	ND	20 CELLULOSE	80 GYPSUM, MISC. PARTICLES.	
Client: <u>27</u> Micro: 43216-27 Analyst: QH TEXTURE TO DRYWALL 2ND FLOOR CHASE ABOVE ANNEALING	ND	ND	100 CALCITE, PAINT, MISC. PARTICLES.	
Client: <u>28</u> Micro: 43216-28 Analyst: QH DRYWALL JOINT COMPOUND 2ND FLOOR CHASE ABOVE ANNEALING	ND	ND	100 CALCITE, PAINT, MISC. PARTICLES.	
Client: <u>29</u> Micro: 43216-29 Analyst: QH DRYWALL 2ND FLOOR CHASE ABOVE ANNEALING	ND	20 CELLULOSE	80 GYPSUM, MISC. PARTICLES.	
Client: <u>30</u> Micro: 43216-30 Analyst: QH TEXTURE TO DRYWALL 2ND FLOOR CHASE ABOVE CLEAN ROOM	ND	ND	100 CALCITE, PAINT, MISC. PARTICLES.	

Technical Supervisor:  4/2/97

Gary Yianping Li, Ph. D.

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MICRO ANALYTICAL LABORATORIES, INC.

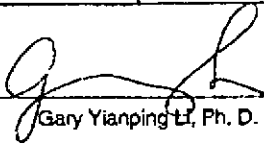
POLARIZED LIGHT MICROSCOPY

1004
American Xtal Technology
4311 Solar Way
Fremont, CA 94538

PROJECT:
NOT GIVEN

Date Sampled 3/31/96
Date Received 4/2/97
Total Samples 36
Micro Log In 43216

SAMPLE INFORMATION	ASBESTOS MINERALS		NON ASBESTOS FIBERS		NON F.BROUS MATRIX	
	PERCENT	TYPE	PERCENT	TYPE	PERCENT	TYPE
Client: <u>31</u> Micro: 43216-31 Analyst: OH DRYWALL JOINT COMPOUND 2ND FLOOR CHASE ABOVE CLEAN ROOM	ND		ND		100	CALCITE, PAINT, MISC. PARTICLES.
Client: <u>32</u> Micro: 43216-32 Analyst: OH DRYWALL 2ND FLOOR CHASE ABOVE CLEAN ROOM	ND		20	CELLULOSE	80	GYPSUM, CALCITE, MISC. PARTICLES.
Client: <u>33</u> Micro: 43216-33 Analyst: OH TEXTURE TO DRYWALL 2ND FLOOR CHASE ABOVE POLYSYNTHESIS	ND		ND		100	CALCITE, PAINT, MISC. PARTICLES.
Client: <u>34</u> Micro: 43216-34 Analyst: OH DRYWALL JOINT COMPOUND 2ND FLOOR CHASE ABOVE POLYSYNTHESIS	ND		ND		100	CALCITE, PAINT, MISC. PARTICLES.
Client: <u>35</u> Micro: 43216-35 Analyst: OH DRYWALL 2ND FLOOR CHASE ABOVE POLYSYNTHESIS	ND		10	CELLULOSE	90	GYPSUM, MISC. PARTICLES.

Technical Supervisor: 

4/2/97

Gary Yianping Li, Ph. D.

PLM analyses follow EPA - 600/M4-82-020, 1982. Asbestos percentage is reported as projected area percent, based on calibrated visual estimates. A note is made if asbestos is quantified by point counting. ND: None detected by PLM. The detection limit is material dependent, and is less than 1% for most friable building materials. Individual layers of heterogeneous samples are analyzed separately; asbestos percentages are reported for the overall sample, and for individual layers as well. The absence of asbestos in wipe samples, and in some non-friable materials, including floor tiles, cannot be conclusively established by PLM, and should be independently confirmed by Transmission Electron Microscopy (TEM). NIST / NVLAP Accreditation (Bulk Asbestos) Lab Code: #1016/2. This report must not be used to claim product endorsement by NIST or any agency of the U.S. Government. This report must not be reproduced except in full, with the approval of Micro Analytical Laboratories, Inc., and pertains only to the samples analyzed herein. n/a = Not Applicable.

MICRO ANALYTICAL LABORATORIES, INC. POLARIZED LIGHT MICROSCOPY

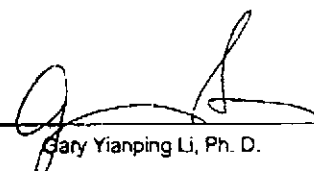
1004
American Xtal Technology
4311 Solar Way
Fremont, CA 94538

PROJECT:
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Date Sampled 3/31/96
Date Received 4/2/97
Total Samples 36
Micro Log In 43216

SAMPLE INFORMATION	ASBESTOS MINERALS		NON ASBESTOS FIBERS		NON FIBROUS MATRIX	
	PERCENT	TYPE	PERCENT	TYPE	PERCENT	TYPE
Client: 36 Micro: 43216-38 Analyst: QH 2'X4' CELLULOSE CEILING TILE 2ND FLOOR CHASE ABOVE ANNEALING	ND		25 20	CELLULOSE FIBROUS GLASS	55	PERLITE, MISC. PARTICLES.

Technical Supervisor: _____



4/2/97

Gary Yianping Li, Ph. D.

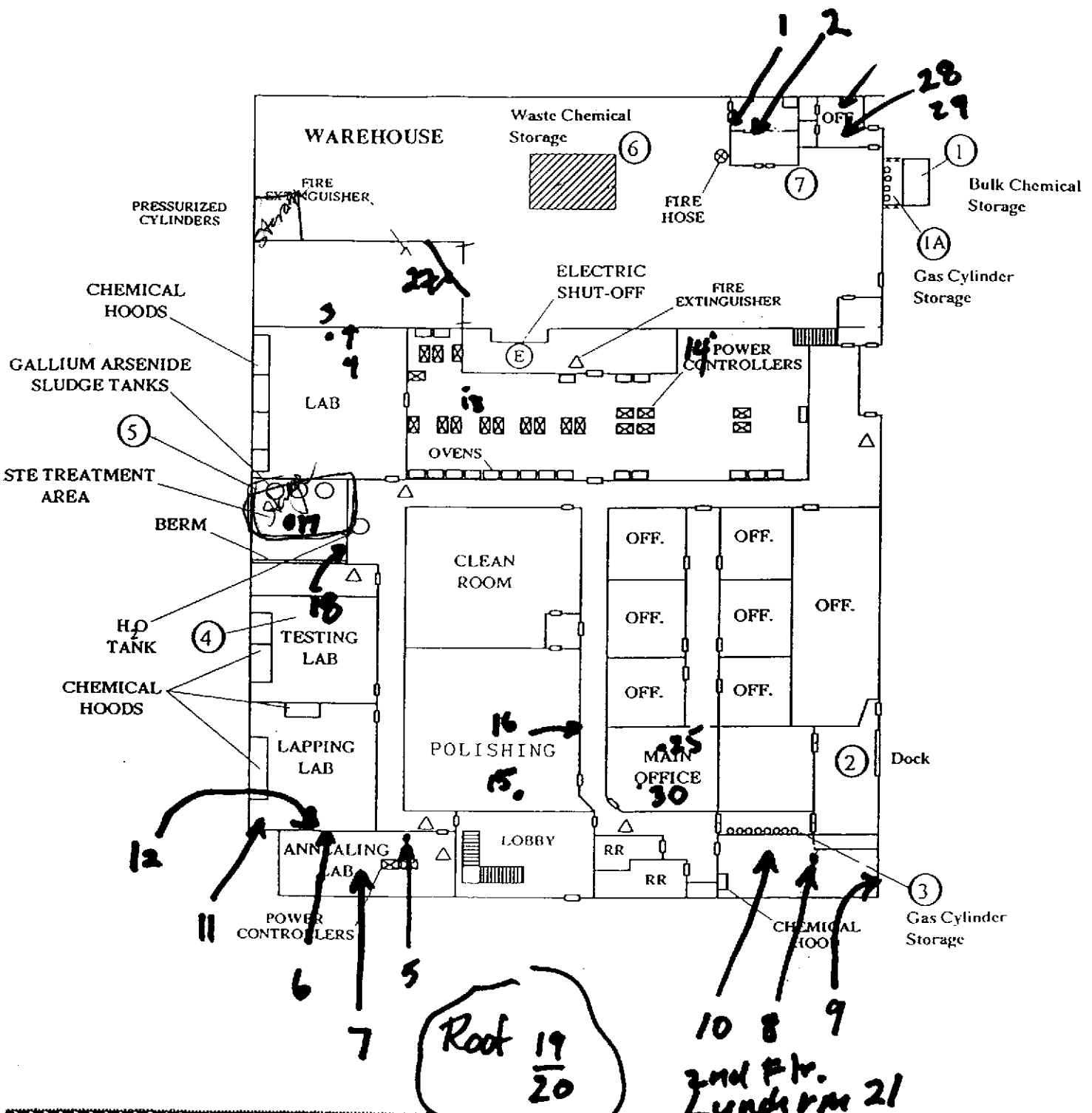
PLM analyses follow EPA - 600/M4-82-020, 1982. Asbestos percentage is reported as projected area percent, based on calibrated visual estimates. A note is made if asbestos is quantified by point counting. ND: None detected by PLM. The detection limit is material dependent, and is less than 1% for most friable building materials. Individual layers of heterogeneous samples are analyzed separately; asbestos percentages are reported for the overall sample, and for individual layers as well. The absence of asbestos in wipe samples, and in some non-friable materials, including floor tiles, cannot be conclusively established by PLM, and should be independently confirmed by Transmission Electron Microscopy (TEM). NIST / NVLAP Accreditation (Bulk Asbestos) Lab Code: #101572. This report must not be used to claim product endorsement by NIST or any agency of the U.S. Government. This report must not be reproduced except in full, with the approval of Micro Analytical Laboratories, Inc., and pertains only to the samples analyzed herein. n/a = Not Applicable.

Wipe Sampling for As
100 sq. cm./wipe
AXT - Dublin
March 28, 1997

Sample No.	Location	Description
1	Sawing	Floor at Saw (SW Corner)
2	Sawing	Wall at door to adjoining storage area
3	Polysynthesis	Floor beneath middle LEV (N wall)
4	Polysynthesis	North Wall (@ electrical junction box)
5	Annealing	Floor (gray stained @ door)
6	Annealing	North wall (adjcent to Lapping)
7	Annealing	Above drop Ceiling - light fixture, mid room
8	Grinding	Floor @ junction point, North wall
9	Grinding	East Wall, near LEV riser
10	Grinding	Top of light fixture
11	Lapping	Floor, SW corner near annealing
12	Lapping	Wall, unpainted drywall door insert
13	Crystal Growth	Floor, mid room, between bench & oven are
14	Crystal Growth	Floor, at exit to warehouse
15	Polishing	Floor, at B1&B2 sump
16	Polishing	Window sill @ doorway
17	Waste Treatment	Concrete floor, mid berm area
18	Waste Treatment	Floor/Wall (berm ledge @ eye wash)
19	Roof	Exhaust LEV mount, above annealing
20	Roof	Inside LEV discharge, above annealing
21	2nd floor lunch room	floor at table

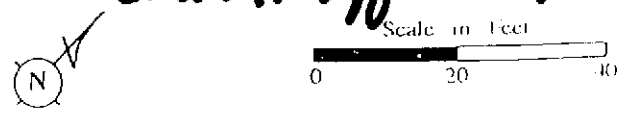
Wipe Sampling For As
 100 sq. cm./wipe
 AXT - Dublin
 March 28, 1997

100 sq. cm. surface wipes			
Sample No.	Location	Description	mg/wipe
20	Roof	Inside LEV discharge, above annealing	20
5	Annealing	Floor (gray stained @ door)	16
2	Sawing	Wall at door to adjoining storage area	5.9
8	Grinding	Floor @ junction point, North wall	4.2
10	Grinding	Top of light fixture	3.5
1	Sawing	Floor at Saw (SW Corner)	1.00
18	Waste Treatment	Floor/Wall (berm ledge @ eye wash)	0.60
11	Lapping	Floor, SW corner near annealing	0.47
12	Lapping	Wall, unpainted drywall door insert	0.29
6	Annealing	North wall (adjacent to Lapping)	0.2
15	Polishing	Floor, at B1&B2.sump	0.18
9	Grinding	East Wall, near LEV riser	0.17
14	Crystal Growth	Floor, at exit to warehouse	0.14
13	Crystal Growth	Floor, mid room, between bench & oven area	0.13
17	Waste Treatment	Concrete floor, mid berm area	0.11
19	Roof	Exhaust LEV mount, above annealing	0.10
16	Polishing	Window sill @ doorway	0.094
7	Annealing	Above drop Ceiling - light fixture, mid room	0.07
3	Polysynthesis	Floor beneath middle LEV (N wall)	0.054
4	Polysynthesis	North Wall (@ electrical junction box)	0.026
21	2nd floor lunch room	floor at table	0.007



AMERICAN XTAL TECHNOLOGY
 6780 SIERRA COURT
 DUBLIN, CALIFORNIA 94568

"SITE MAP" - MAIN BUILDING



Date: November 17, 1994

Analytical Results
for
American Xtal Technology

Clayton Project No. 97040.08

Sample Identification: See Below
 Lab Number: 9704008
 Sample Matrix/Media: WIPE
 Digestion Method: OSHA ID121M
 Method Reference: OSHA ID121M
 Date Received: 04/01/97
 Date Digested: 04/07/97
 Date Analyzed: 04/07/97

Lab Number	Sample Identification	Date Sampled	Arsenic (mg/wipe)	Method Detection Limit (mg/wipe)
-01	AXT-1	03/28/97	1.0	0.003
-02	AXT-2	03/28/97	5.9	0.003
-03	AXT-3	03/28/97	0.054	0.003
-04	AXT-4	03/28/97	0.026	0.003
-05	AXT-5	03/28/97	16	0.003
-06	AXT-6	03/28/97	0.20	0.003
-07	AXT-7	03/28/97	0.070	0.003
-08	AXT-8	03/28/97	4.2	0.003
-09	AXT-9	03/28/97	0.17	0.003
-10	AXT-10	03/28/97	3.5	0.003
-11	AXT-11	03/28/97	0.47	0.003
-12	AXT-12	03/28/97	0.29	0.003
-13	AXT-13	03/28/97	0.13	0.003
-14	AXT-14	03/28/97	0.14	0.003
-15	AXT-15	03/28/97	0.18	0.003
-16	AXT-16	03/28/97	0.094	0.003
-17	AXT-17	03/28/97	0.11	0.003
-18	AXT-18	03/28/97	0.60	0.003
-19	AXT-19	03/28/97	0.10	0.003
-20	AXT-20	03/28/97	20	0.003
-21	AXT-21	03/28/97	0.007	0.003
-22	METHOD BLANK	--	<0.003	0.003
-23	METHOD BLANK	--	<0.003	0.003

ND: Not detected at or above limit of detection
 ---: Information not available or not applicable

REQUEST FOR LABORATORY ANALYTICAL SERVICES

IMPORTANT

For Clayton Use Only
Clayton Lab Project No.

9704008

Date Results Requested: NTAT
Rush Charges Authorized? Yes No
 Phone or Fax Results

REPORT RESULTS TO	Name <u>ED HAGGERTY</u>	Client Job No.	Purchase Order No. <u>10325</u>
	Company <u>Americanxtal Tech.</u>	Dept.	Name
	Mailing Address <u>4311 Solar Way</u>		Company
	City, State, Zip <u>Fremont, CA 94538</u>		Address
Telephone No. <u>683-5900 x127</u>	FAX No. <u>683-5901</u>		City, State, Zip

Special instructions and/or specific regulatory requirements:
(method, limit of detection, etc.)
100cf wipe samples for As by ICP (15% discount)
Explanation of Preservative: NTAT

Samples are: (check if applicable)
 Drinking Water
 Groundwater
 Wastewater

ANALYSIS REQUESTED
(Enter an 'X' in the box below to indicate request; Enter a 'P' if Preservative added.)

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX/MEDIA	AIR VOLUME (specify units)	Number of Containers	ANALYSIS REQUESTED										FOR LAB USE ONLY		
<u>AXT-1</u>	<u>3/28</u>		<u>42</u>	<u>g/L</u>	<u>1</u>	As by ICP										<u>61</u>		
<u>AXT-2</u>			<u>Whitman</u>															<u>62</u>
<u>-3</u>			<u>FILTER</u>															<u>63</u>
<u>-4</u>																		<u>64</u>
<u>-5</u>																		<u>65</u>
<u>-6</u>																		<u>66</u>
<u>-7</u>																		<u>67</u>
<u>-8</u>																		<u>68</u>
<u>-9</u>																		<u>69</u>
<u>-10</u>																		<u>70</u>

CHAIN OF CUSTODY	Collected by: <u>S. Haggerty</u> (print)	Collector's Signature:		
	Relinquished by: <u>S. Haggerty</u>	Date/Time <u>4/1/87</u>	Received by:	Date/Time
	Relinquished by:	Date/Time	Received by:	Date/Time
	Method of Shipment:	Received at Lab by: <u>Carol Hammer</u>	Date/Time: <u>4/1/87</u>	
Authorized by: <u>S. Haggerty</u> (Client Signature MUST accompany Request)	Date: <u>3/28/87</u>	Sample Condition Upon Receipt: <input checked="" type="checkbox"/> Acceptable <input type="checkbox"/> Other (explain)		

Please return completed form and samples to one of the Clayton Environmental Consultants, Inc. labs listed below:

Detroit Regional Lab 22345 Roehel Drive Novi, MI 48375 (800) 806-5887 (810) 344-1770 FAX (810) 344-2655	Atlanta Regional Lab 400 Chastain Center Blvd., N.W., Suite 490 Kennesaw, GA 30144 (800) 252-9919 (770) 499-7500 FAX (770) 423-4990	San Francisco Regional Lab 1252 Quarry Lane Pleasanton, CA 94566 (800) 294-1755 (510) 426-2657 FAX (510) 426-0106	Seattle Regional Lab 4636 E. Marginal Way S., Suite 215 Seattle, WA 98134 (800) 568-7755 (206) 763-7364 FAX (206) 763-4189
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DISTRIBUTION:
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Yellow = Clayton Accounting
Pink = Client Copy

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ENVIRONMENTAL
CONSULTANTS

REQUEST FOR LABORATORY ANALYTICAL SERVICES

NTAT

For Clayton Use Only Page 2 of 3

Project No. _____

Batch No. **9704008**

Ind. Code _____ W.P. _____

Date Logged In _____ By _____

REPORT RESULTS TO	Name _____ Title _____		Purchase Order No. <u>10325</u>		Client Job No. _____		
	Company <u>American Xtal Tech.</u> Dept. _____		Name _____		Company _____ Dept. _____		
	Mailing Address _____		Address _____		City, State, Zip _____		
	City, State, Zip _____		City, State, Zip _____		City, State, Zip _____		
Telephone No. _____		Telefax No. _____		City, State, Zip _____			
Date Results Req. _____		Rush Charges Authorized? <input type="checkbox"/> Yes <input type="checkbox"/> No		Phone / Fax Results <input type="checkbox"/> <input type="checkbox"/>		Samples are: (check if applicable)	
Special Instructions: (method, limit of detection, etc.) <u>WIPES FOR AS BY ICP</u>		Explanation of Preservative: <u>15% ASBLUANT</u>		<input type="checkbox"/> Drinking Water		<input type="checkbox"/> Collected in the State of New York	
CLIENT SAMPLE IDENTIFICATION		DATE SAMPLED	MATRIX/MEDIA	AIR VOLUME (specify units)	ANALYSIS REQUESTED (Enter an 'X' in the box below to indicate request; Enter a 'P' if Preservative added. *)		FOR LAB USE ONLY
<u>AXT-11</u>		<u>3/28</u>	<u>Water</u>	<u>100 mL</u>	<u>1</u>	<u>X</u>	<u>11</u>
<u>-12</u>			<u>42</u>				<u>12</u>
<u>-13</u>							<u>13</u>
<u>-14</u>							<u>14</u>
<u>-15</u>							<u>15</u>
<u>-16</u>							<u>16</u>
<u>-17</u>							<u>17</u>
<u>-18</u>							<u>18</u>
<u>-19</u>							<u>19</u>
<u>-20</u>							<u>20</u>
CHAIN OF CUSTODY	Collected by: <u>E. J. Anger</u> (print)		Collector's Signature: _____		Date/Time _____		
	Relinquished by: <u>E. J. Anger</u>		Date/Time <u>1/1/97 8:55</u>		Received by: _____		Date/Time _____
	Relinquished by: <u>E. J. Anger</u>		Date/Time _____		Received at Lab by: <u>Carol Hammer</u>		Date/Time <u>1/1/97 8:54</u>
	Method of Shipment: _____		Sample Condition Upon Receipt: <input checked="" type="checkbox"/> Acceptable <input type="checkbox"/> Other (explain)				
Authorized by: <u>E. J. Anger</u> (Client Signature Must Accompany Request)		Date <u>3/28/97</u>					

Please return completed form and samples to one of the Clayton Environmental Consultants, Inc. labs listed below:

22345 Roethel Drive Novi, MI 48375 (810) 344-1770	Raritan Center 160 Fieldcrest Ave. Edison, NJ 08837 (908) 225-6040	400 Chastain Center Blvd., N.W. Suite 490 Kennesaw, GA 30144 (404) 499-7500	1252 Quarry Lane Pleasanton, CA 94566 (510) 426-2657
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DISTRIBUTION:
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PINK - Client Retains

REQUEST FOR LABORATORY ANALYTICAL SERVICES

For Clayton Use Only Page 3 of 3

Project No. _____

Batch No. 3704008

Ind. Code _____ W.P. _____

Date Logged In _____ By _____

REPORT RESULTS TO	Name _____ Title _____	Purchase Order No. <u>10325</u>		Client Job No. _____	
	Company <u>American Xtal Tech</u> Dept. _____	SEND INVOICE TO		Name _____	
	Mailing Address _____	Company _____		Dept. _____	
	City, State, Zip _____	Address _____		City, State, Zip _____	
Telephone No. _____	Telefax No. _____		ANALYSIS REQUESTED (Enter an 'X' in the box below to indicate request; Enter a 'P' if Preservative added.)		
Date Results Req.:	Rush Charges Authorized? <input type="checkbox"/> Yes <input type="checkbox"/> No	Phone / Fax Results <input type="checkbox"/> <input type="checkbox"/>	Samples are: (check if applicable)		
Special Instructions: (method, limit of detection, etc.)			<input type="checkbox"/> Drinking Water		
Explanation of Preservative: <u>NTAT</u>			<input type="checkbox"/> Collected in the State of New York		
CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	MATRIX/MEDIA	AIR VOLUME (specify units)	Number of Containers	FOR LAB USE ONLY
<u>ART-21</u>	<u>3/28</u>	<u>Whitney</u>	<u>100 ml</u>	<u>1</u>	<u>SI A</u>
<i>(Large X mark over the table)</i>					
CHAIN OF CUSTODY	Collected by: <u>[Signature]</u> (print)	Collector's Signature: _____			
	Relinquished by: <u>[Signature]</u> Date/Time <u>4/1/97</u>	Received by: _____		Date/Time _____	
	Relinquished by: _____ Date/Time _____	Received at Lab by: <u>[Signature]</u>		Date/Time <u>8:54</u>	
	Method of Shipment: _____	Sample Condition Upon Receipt: <input checked="" type="checkbox"/> Acceptable <input type="checkbox"/> Other (explain)			
Authorized by: <u>[Signature]</u> Date <u>3/28/97</u>		(Client Signature Must Accompany Request)			

Please return completed form and samples to one of the Clayton Environmental Consultants, Inc. labs listed below:

22345 Roethel Drive Novi, MI 48375 (810) 344-1770	Raritan Center 160 Fieldcrest Ave. Edison, NJ 08837 (908) 225-6040	400 Chastain Center Blvd., N.W. Suite 490 Kennesaw, GA 30144 (404) 499-7500	1252 Quarry Lane Pleasanton, CA 94566 (510) 426-2657
---	---	--	--

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Plotted Location #

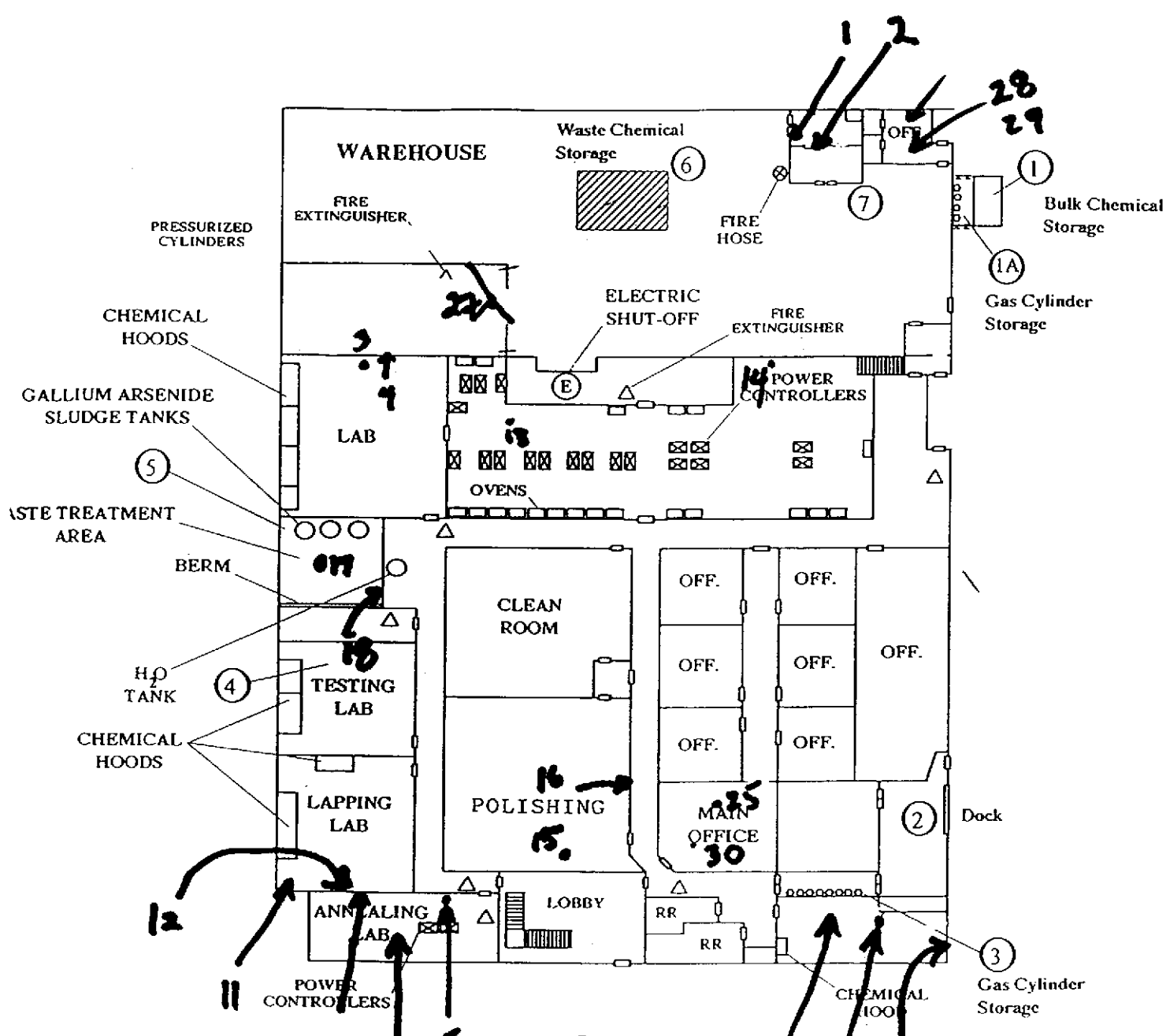
25
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31

Samples from Dublin Site			16-Apr-97
No.	Type of Sample	Description	
1	Wipe Sample (100 cm ²)	Light fixture above drop ceiling - 1st floor Main Office Area	0.42 mg/wipe
2	Wipe Sample (100 cm ²)	Light fixture above drop ceiling - 2nd floor Office adjacent to rest room area	0.040 mg/wipe
3	Wipe Sample (100 cm ²)	Structural Cross Support (Warehouse/Slicing)	1.3 mg/wipe
4	Wipe Sample (100 cm ²)	Light fixture above drop ceiling - Safety Office Area	0.044 mg/wipe
5	Bulk Sample (carpet)	Blue carpet, Safety Office, 56 g., 31.5 sq. in.	360 mg/kg
6	Bulk Sample (carpet)	Blue carpet, Main Office, 43 g., 31.25 sq. in.	420 mg/kg
7	Bulk Sample (carpet)	Brown carpet, 2nd Floor Office, 43 g., 32.8 sq. in.	86 mg/kg

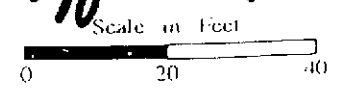
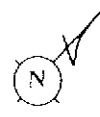
Verticals reported 4/27

LSV in this area

← 0.42 mg/wipe
 ← 0.040 mg/wipe
 ← 1.3 mg/wipe
 ← 0.044 mg/wipe
 ← 360 mg/kg
 ← 420 mg/kg
 ← 86 mg/kg



AMERICAN XTAL TECHNOLOGY
 6780 SIERRA COURT
 DUBLIN, CALIFORNIA 94568
 "SITE MAP" - MAIN BUILDING



Date November 17, 1994

Analytical Results
for
American Xtal Technology

Clayton Project No. 97042.07

Sample Identification: See Below	Date Received: 04/16/97
Lab Number: 9704207	Date Digested: 04/21/97
Sample Matrix/Media: WIPE	Date Analyzed: 04/21/97
Digestion Method: OSHA ID121M	
Method Reference: OSHA ID121M	

Lab Number	Sample Identification	Date Sampled	Arsenic (mg/wipe)	Method Detection Limit (mg/wipe)
-01	AXT #1 WIPE	04/16/97	0.12	0.003
-02	AXT #2 WIPE	04/16/97	0.040	0.003
-03	AXT #3 WIPE	04/16/97	1.3	0.003
-04	AXT #4 WIPE	04/16/97	0.044	0.003
-08	METHOD BLANK	--	<0.003	0.003

ND: Not detected at or above limit of detection
 --: Information not available or not applicable

Clayton

ENVIRONMENTAL CONSULTANTS

REQUEST FOR LABORATORY ANALYTICAL SERVICES

IMPORTANT

Date Results Requested: 4-23-97

Rush Charges Authorized? Yes No

Phone or Fax Results

Page 1 of 1

For Clayton Use Only
Clayton Lab Project No.

9704207

RECEIVED RESULTS TO	Name <u>ED HAGGERTY</u>	Client Job No.	Purchase Order No.
	Company <u>AMERICAN XTAL TECH</u>	Dept.	Name
	Mailing Address <u>4311 Sojak Way</u>		Company
	City, State, Zip <u>Fremont CA 94528</u>		Address
Telephone No. <u>510-683-5600</u>	FAX No. <u>510-683-5901</u>		City, State, Zip

Special instructions and/or specific regulatory requirements:
(method, limit of detection, etc.)

WIPES ARE 100 CM² SURFACE AREA

WILL CAL W. P.O. and RESULTS

Explanation of Preservative: Date Requested

Samples are:
(check if applicable)

Drinking Water
 Groundwater
 Wastewater

Number of Containers	ANALYSIS REQUESTED (Enter an 'X' in the box below to indicate request; Enter a P if Preservative added.)												FOR LAB USE ONLY
	<u>ARSENIC - ICP/MS</u> <u>ARSENIC - ITEL</u>												

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX/MEDIA	AIR VOLUME (specify units)
<u>AXT #1 WIPE</u>	<u>4/16</u>		<u>42cm</u>	<u>W/A</u>
<u>#2 WIPE</u>			<u>W/A</u>	
<u>#3 WIPE</u>				
<u>#4 WIPE</u>				
<u>#5 BULK (carpet)</u>				
<u>#6 BULK (carpet)</u>				
<u>#7 BULK (carpet)</u>				

CHAIN OF CUSTODY	Collected by: <u>E. Haggerty</u> (print)	Collector's Signature:
	Relinquished by: <u>E. Haggerty</u>	Date/Time <u>4/16/97</u>
	Relinquished by:	Date/Time
	Method of Shipment:	Date/Time
	Authorized by: <u>G. Edward J. Haggerty</u> Date <u>4/16/97</u>	Received at Lab by: <u>Carol Hammerberg</u> Date/Time <u>4/16/97 2:45 PM</u>

Sample Condition Upon Receipt: Acceptable Other (explain)
Analyze samples on a 5 day TWT per Ed on 4-16-97

Please return completed form and samples to one of the Clayton Environmental Consultants, Inc. labs listed below:

Detroit Regional Lab 22345 Rosette Drive Novi, MI 48375 (600) 806-5887 (610) 344-1770 FAX (810) 344-2655	Atlanta Regional Lab 400 Chastain Corner Blvd., N.W., Suite 490 Kennesaw, GA 30144 (800) 252-9919 (770) 499-7500 FAX (770) 423-4990	San Francisco Regional Lab 1252 Quarry Lane Pleasanton, CA 94586 (500) 294-1755 (510) 426-2657 FAX (510) 426-0106	Seattle Regional Lab 4636 E. Marginal Way S., Suite 215 Seattle, WA 98134 (800) 568-7755 (206) 763-7354 FAX (206) 763-4189
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Pink = Client Copy

Solid Waste Samples to Clayton for TCLP As

Dublin Site 4/10/96				
Duct Samples for Waste Characterization				
No.	Description	Work Area	Gross Weight	Sample Surface Area (appro
1	8" LEV exhaust duct entry	Crystal Growth	158 g.	85 sq. in.
2	10" LEV straight run before riser	Crystal Growth	250 g.	78 sq. in.
3	Exhaust hood entry/flange	Polysynthesis	108 g.	44 sq. in.*
4	10" LEV horizontal run	Grinding	196 g.	75 sq. in.
5	10" LEV riser (junction flex to main)	Cutting (above build-out)	94 g.	45 sq.in.
6	10" LEV riser	Annealing	114 g.	64 sq. in.
	* 4"x4" = approx. 39 g.			



Analytical Results
for
American Xtal Technology

Clayton Project No. 97041.22

Sample Identification: See Below
 Lab Number: 9704122
 Sample Matrix/Media: SOLID
 Digestion Method: EPA 3010A
 Preparation Method: EPA 1311
 Method Reference: EPA 6010A

Date Received: 04/10/97
 Date Digested: 04/15/97
 Date Prepared: 04/13/97
 Date Analyzed: 04/15/97

Lab Number	Sample Identification	Date Sampled	TCLP Arsenic (mg/L)	Method Detection Limit (mg/L)
-01	AXT #1-8"LEV-C.G.	04/10/97	0.3	0.3
-02	AXT #2-10"LEV-C.G.	04/10/97	<0.3	0.3
-03	AXT #3-HOOD INLET-POLY	04/10/97	<0.3	0.3
-04	AXT #4-10"LEV-GRINDING	04/10/97	1.3	0.3
-05	AXT #5-10"LEV-CUTTING	04/10/97	<0.3	0.3
-06	AXT #6-10"LEV-ANNEAL.	04/10/97	<0.3	0.3
-07	METHOD BLANK	--	<0.3	0.3

ND: Not detected at or above limit of detection
 ---: Information not available or not applicable

**REQUEST FOR LABORATORY
ANALYTICAL SERVICES**

For Clayton Use Only Page 1 of 1
 Project No. _____
 Batch No. 9704122
 Ind. Code _____ W.P. _____
 Date Logged In 4/10 By ML
 Client Job No. _____

REPORT RESULTS TO
 Name Ed Haggerty Title _____
 Company American Aerial Technology Dept. _____
 Mailing Address 4311 Solar Way
 City, State, Zip Fremont, CA 94538
 Telephone No. 683-5900 8127 Telefax No. 683-5901
 Date Results Req. _____
 Rush Charges Authorized? Yes No
 Phone / Fax Results _____

SEND INVOICE TO
 Purchase Order No. _____
 Name _____
 Company _____
 Address _____
 City, State, Zip _____
 Dept. _____

Special Instructions: (method, limit of detection, etc.)
WILL CALL W. P.O. - REQUIRED TURNAROUND - possibly 5 days?
 Explanation of Preservative: _____
 Samples are: (check if applicable)
 Drinking Water
 Collected in the State of New York

ANALYSIS REQUESTED
 (Enter an 'X' in the box below to indicate request; Enter a 'P' if Preservative added.)

Number of Containers	ANALYSIS REQUESTED								FOR LAB USE ONLY	
	As	As	As	As	As	As	As	As		
1	X								(158)	-01A
									(250)	-02
									(108)	-03
									(196)	-04
									(74)	-05
									(114)	-06

Arsenic (TOP)

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	MATRIX/MEDIA	AIR VOLUME (specify units)
ACT # 1 - 8" LEV - C.B.	4/10	solid	pl. bag
ACT # 2 - 10" LEV - C.G.		metal	
ACT # 3 - hood inlet - poly		sub. bag	
ACT # 4 - 10" LEV - Grinding			
ACT # 5 - 10" LEV - Cuttings			
ACT # 6 - 10" LEV - Armeal			

CHAIN OF CUSTODY
 Collected by: S. Haggerty
 Requisitioned by: S. Haggerty Date/Time 4/10/97
 Requisitioned by: _____ Date/Time _____
 Method of Shipment: _____
 Authorized by: S. Haggerty Date 4/10/97
 (Client Signature Must Accompany Request)

Collector's Signature: _____
 Received by: _____ Date/Time _____
 Received at Lab by: Carol Hemmerberg Date/Time 4/10/97 1:35pm
 Sample Condition Upon Receipt: Acceptable Other (explain)
Analyze on 5 day TAT per Ed on 4-11-97 7:11 PM

Please return completed form and samples to one of the Clayton Environmental Consultants, Inc. labs listed below:

22345 Roethel Drive Novi, MI 48375 (313) 344-1770	Raritan Center 160 Fieldcrest Ave. Edison, NJ 08837 (908) 225-6040	400 Chastain Center Blvd., N.W. Suite 490 Kennesaw, GA 30144 (404) 499-7500	1252 Quarry Lane Pleasanton, CA 94566 (510) 426-2857
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DISTRIBUTION:
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 YELLOW - Clayton Accounting
 PINK - Client Retains

SENI BY: XEROX Copier 7020 : 4-17-97 : 9:36AM : CLAYTON PLEAS LAB- 510 6835801 : # 4