the actual field data, a modified plan is now being prepared for the remaining unreleased areas. This modified plan will detail in situ containment as the preferred control method.

All sides are very anxious that the site securement plan, which will take two construction seasons, be completed in 1982. Accordingly, a demolition contract has been let by Velsicol and, at this point, we are in the process of demolishing tanks, equipment, and buildings located in the released areas. Demolition will not commence for the remainder of the plant site until we have received a release for unrestricted use from Region III. Critical to this demolition program is the timing of the release, if we are to complete the demolition during this construction season. Delays in instituting the containment program as well as substantial cost increases can be expected if demolition work has to be carried over into the 1982 construction season. Essentially, by November 1, 1981, we want all buildings to be down, rubble and other debris placed and compacted for effective site contouring and an initial 6" clay cap placed over these areas to control run-off quality during the coming winter. With concurrance for in situ control of the radiation containing soil, an appropriate cover would be installed over the "hop spot" areas so that building demolition could proceed without disturbing the area of contamination.

If satisfactory agreement with EPA/DNR can be reached, Velsicol expects to move into the actual site control phase with the beginning of the 1982 construction season. As indicated in the preliminary site closure plan, we would provide an approved clay cap for leachate control over the entire plant site graded to minimize infiltration and maximize evaporation of surface run off with the entire site covered with top soil and seeded. Control of groundwater flow through the site will be effected with the installation of a slurry wall keyed into the clay till underneath the plant site. Certain portions of the plan are currently the subject of negotiation with the agencies, which all parties hope will lead to a consent judgment acceptable to all sides. The governmental agencies are currently drafting a revised version of this document and expect to provide it to the company some time in June. Negotiations have extended over many months and both sides agree we are at a point where agreement must be reached or litigation will ensue.

As we noted in our meeting, the information we have on the radioactive "hot spots" at this time suggests that a large quantity of soil may contain residual low level radioactivity from the rare earth processing operation in the late 1960's and perhaps from the Atomic Energy Commission contracted work in the 1950's. Velsicol proposes to leave this soil in place on the plant site for the following reasons:

1. The soil containing radionuclides would not be disturbed or subject to transport from the boundaries of the plant site because the clay cap will minimize infiltration of water and the slurry wall will prevent ground water from flowing through the site. The environmental containment measures developed to keep chemical contaminants from escaping the site would likewise serve to prevent radionuclides from escaping the plant site.

2. This site will be monitored and maintained for a minimum of 35 years with an opportunity for the agencies, which are party to the judgment, to request the court to extend the maintenance period. Exposure will be kept to an absolute minimum because access to the site will be limited except for necessary maintenance work, monitoring activities and government agency inspections. Although it would appear unlikely, should the site be sold at some point, as a condition of the consent judgment, restrictive convenants will ensure that no activities occur which would threaten the security of the containment system.

3. The soil in which radionuclides are present also contains numerous chemicals. Many of these chemicals are hazardous in nature, such as polybrominated biphenyls, DDT, etc. Just as with chemical waste disposal sites precluding disposal of radioactive wastes, there may be a comparable reluctance on the part of the few existing low level radioactive waste disposal sites to accept comingled radioactive/hazardous wastes. It is possible these specialized sites would not want to qualify to handle hazardous wastes becuase of the jurisdictional questions involved. Additionally, potential exposure problems to workers, community and general environment may be exacerbated with the excavation program.

4. A cost/benefit analysis for leaving the soil in place as opposed to excavating and removing it to a low level radioactive waste disposal site will demonstrate that depending upon the exact quantities involved, excavating the materials will add up to three million dollars to the cost over in situ control.

5. It would appear that such an approach would be consistent with the decommissioning option of neutralization and stabilization on site for radioactive ores as set forth in the "Draft Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities" (NUREG 0586.) Our consultants will develop the analysis documenting this proposal.

In order to provide the Nuclear Regulatory Commission with all relevant background information available which may bear upon the decision, we are enclosing copies of the following information:

1. A series of Dames & Moore and Conestoga-Rovers & Associates site containment proposals which are being refined into an approvable program:

   i) Conceptual Environmental Security Plan - St. Louis, Michigan plant site; Dames & Moore, 1/25/80

   ii) Clarification of Environmental Security Plan - St. Louis, Michigan plant site; Dames & Moore, 5/1/80

   iii) Appendix 1 Containment Program - St. Louis plant; Conestoga-Rovers & Associates, 3/26/81.

2. Existing "Decontamination and Survey Plan".

3. Interim Recommendation for Analysis of Soil Samples "Hot Spots" Radiation Survey.

We expect to furnish in a few days the external radioactivity readings and accompanying grid map on the 70% of the plant site released for unrestricted use. As soon as the isotopic analysis of the soil samples noted in (3) is available along with a draft Consent Judgment and the revised Decontamination and Survey Plan, we will forward that information to you.

Because of the desire of the company and various governmental agencies to settle their differences amicably and to implement a program during the 1981 construction season, we would appreciate consideration of this request in the near future.

Sincerely,

John M Rademacher

J. M. Rademacher
Vice President
Environmental, Health &
Regulatory Affairs

JMR:jma
Enclosures
cc: Dale Bryson

DECONTAMINATION & SURVEY PLAN FOR
VELSICOL CHEMICAL CORPORATION PLANT SITE
AT ST. LOUIS, MICHIGAN

July 15, 1980

This survey plan is submitted in response to previous correspondence with the Nuclear Regulatory Commission (NRC) as a reasonable effort to eliminate residual contamination existing at the Velsicol Chemical Corporation plant site in St. Louis, Michigan. This is a plan indicating continuing effort which was begun on May 15, 1980 by initiating repackaging of feed materials for shipment to a licensed burial facility. With this task nearing completion the following describes the survey plan with time schedules for review by the NRC. If there are questions regarding the plan or if the NRC can provide suggestions which would result in a more efficient or acceptable plan, please notify us so adjustments can be made.

The survey plan will be divided into three areas. Since demolition of buildings on the plant site is a priority item for total decommissioning, the Area "A" indicated will be surveyed based on a grid for open areas with average readings given in the survey report. A reading in excess of 20 microrem/hr. above background at one meter from the surface will be assumed to be contaminated and decontamination over this area will be performed by removing soil in the higher reading area. For buildings, interior surfaces, and areas not included as open areas, surveys will be

made at drain lines, traps, and other appropriate access points. The Area "A" was chosen for this type survey based on the plant operations. This area was outlined based on interviews with plant employees indicating no radioactive material or material involved in processing the rare earth feed stock was used, stored, or transported into or across this area. The railroad track formed somewhat of a boundary for this activity. No wipe tests or other sampling will be included as part of Area "A" unless meter readings in excess of 20 microrem/hr. above background are discovered. A separate sampling of the bricks on the Pine River shoreline is being performed. This result with be reported, but unless the specific findings indicate a hazard exists, the bricks will remain undisturbed since they form a good barrier to the Pine River. Prevention of erosion into the Pine River, in which the bricks play an important part, is currently a major part of the environmental control requirements under discussion with EPA/DNR. An attempt will also be made to determine whether levels of radioactivity in the bricks existed when they were acquired. Release of this section of the plant site for demolition will be requested upon completion of a satisfactory survey and decontamination if necessary.

Area "B" will be considered somewhat similar to Area "A" except for the roads where the rare earth material was transported. Areas "A" and "B" are separated based on a possible early release of Area "A" and the

roads of Area "B" over which rare earth material was transported. The routes suspect of radioactive material transport will be scanned and readings recorded in microrem/hr. Other open areas included in Section "B" will be surveyed according to the pattern of Area "A". For buildings, interior surfaces, and areas not "open", surveys will be made at drain lines, traps and appropriate access points. Readings will be recorded as microrem/hr.

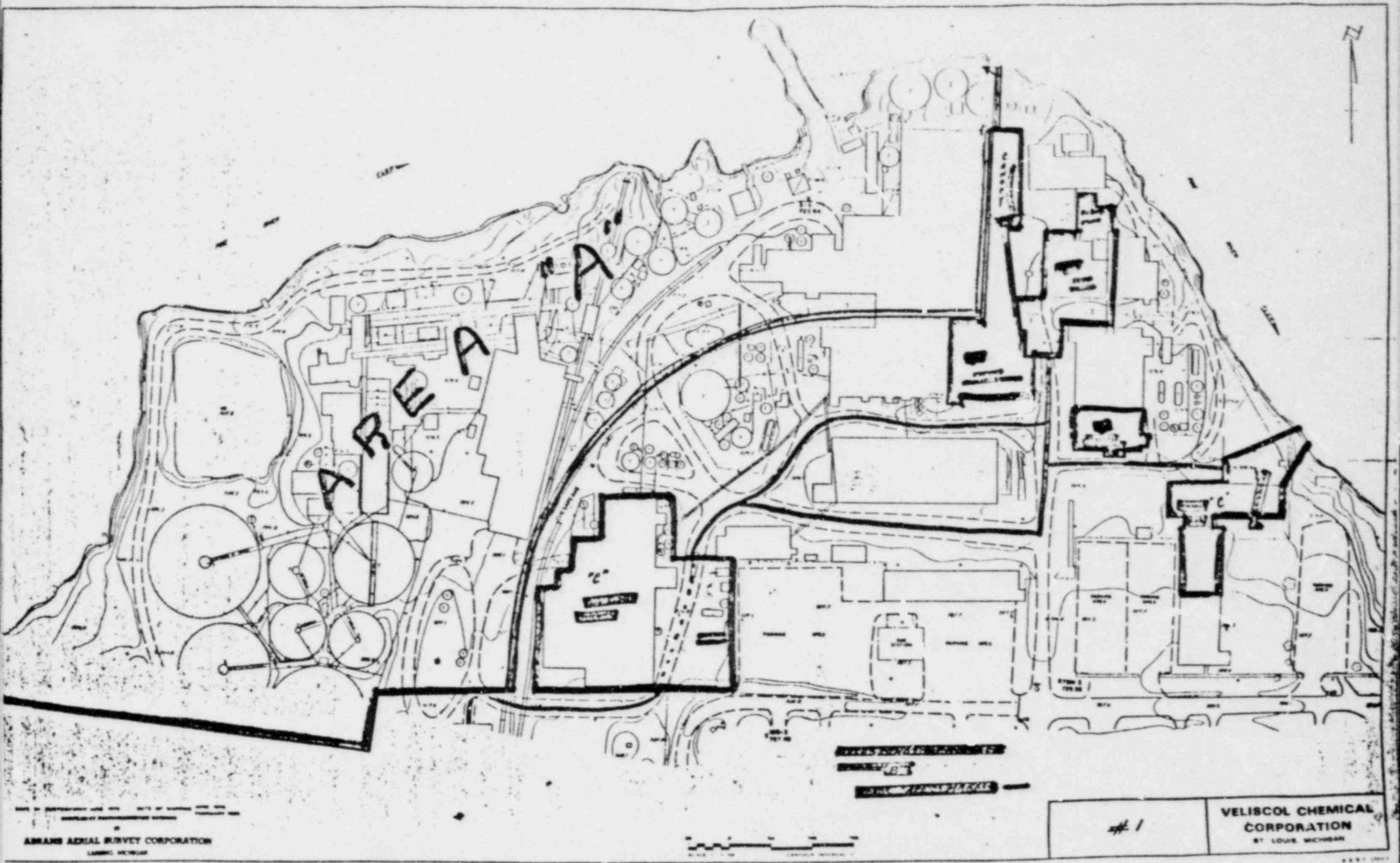
Area "C" includes the places where radioactive material is believed to have been received, stored, or processed in some way. Open areas in this area will be surveyed on a grid pattern similar to other areas except for specific areas of known activity such as the barrel site near the drum storage area, the pilot plant area, the rare earth storage area and the refrigeration plant. Open areas such as these will be surveyed on a smaller grid (a size of one to five meters squared will be considered) and readings recorded in microrem/hr. All areas where the readings are in excess of 20 microrem/hr. above background at one meter from the surface will be tested and appropriate amounts removed such that levels of thorium daughter products are below 35 picocuries/gram. All buildings, tanks or other structures included in this area will be surveyed and wipe tests will be taken in areas of suspect contamination. The wipe test results will be reported in terms of microcuries and the necessity for decontamination will be based on the Guidelines for Decontamination provided by the NRC. Each building will be reported separately in this

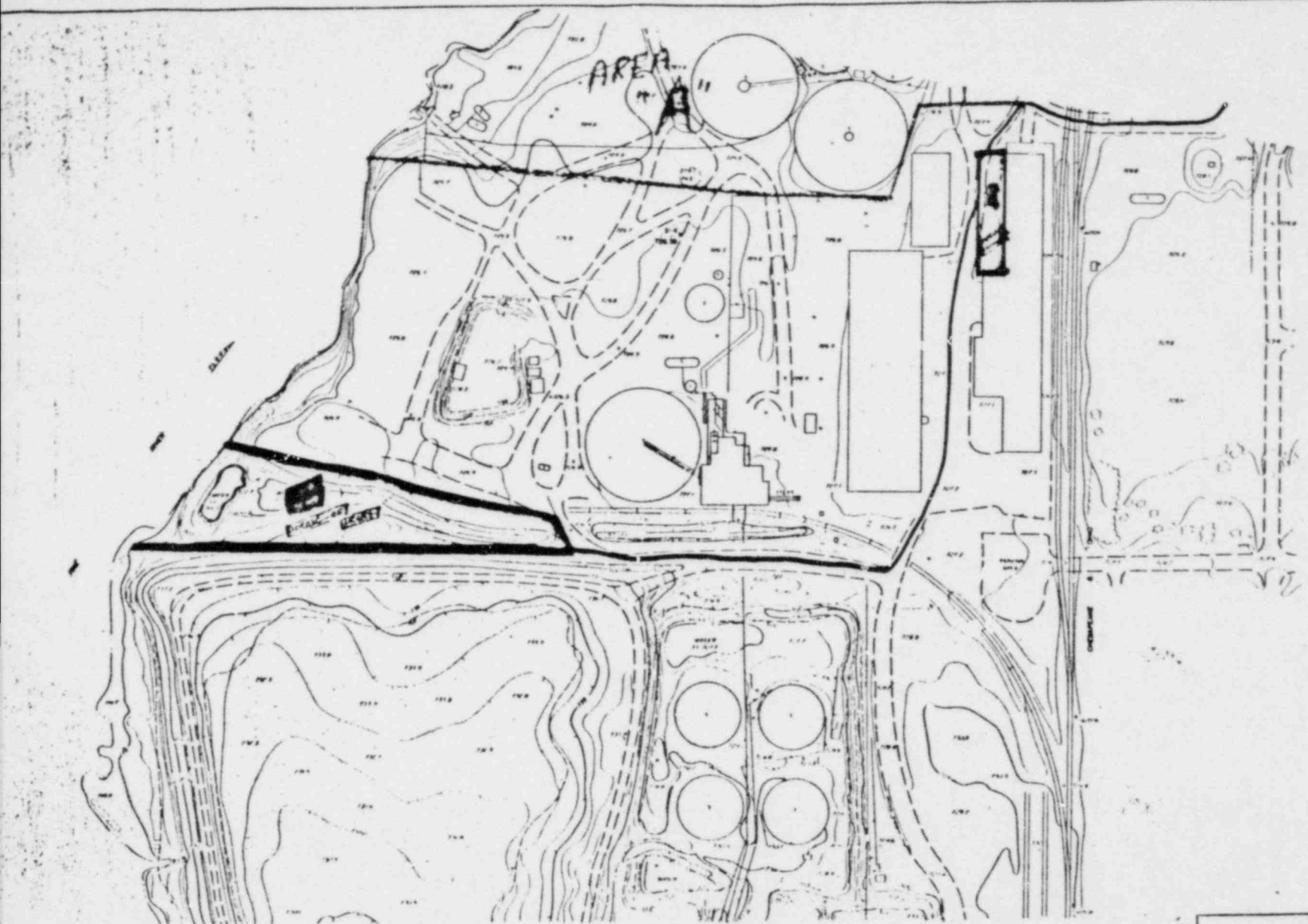
Area "C".

Decontamination, where necessary, will proceed in compliance with the guidelines provided. Except for possible exceptions such as the shoreline bricks, unrestricted release levels will be based on picocuries per gram of soil and microcuries per hour above background at one meter above the surface.

Based on the survey and decontamination plan outlined, we feel that the plant site, especially with the clay cap after decommissioning, will be acceptable for release to unrestricted use. Although this basic plan seems general it specifies the levels set forth in the decontamination of the facility. The actual survey and decontamination is scheduled to begin the week of July 28th.

Enclosed find a map of the plant site in three (3) sections with Areas A, B & C drawn in accordance with the previous discussion of the survey and decontamination plan.


AREA A
AREA A'
ABRAMS AERIAL SURVEY CORPORATION
VELISCOL CHEMICAL CORPORATION
ST. LOUIS, MICHIGAN

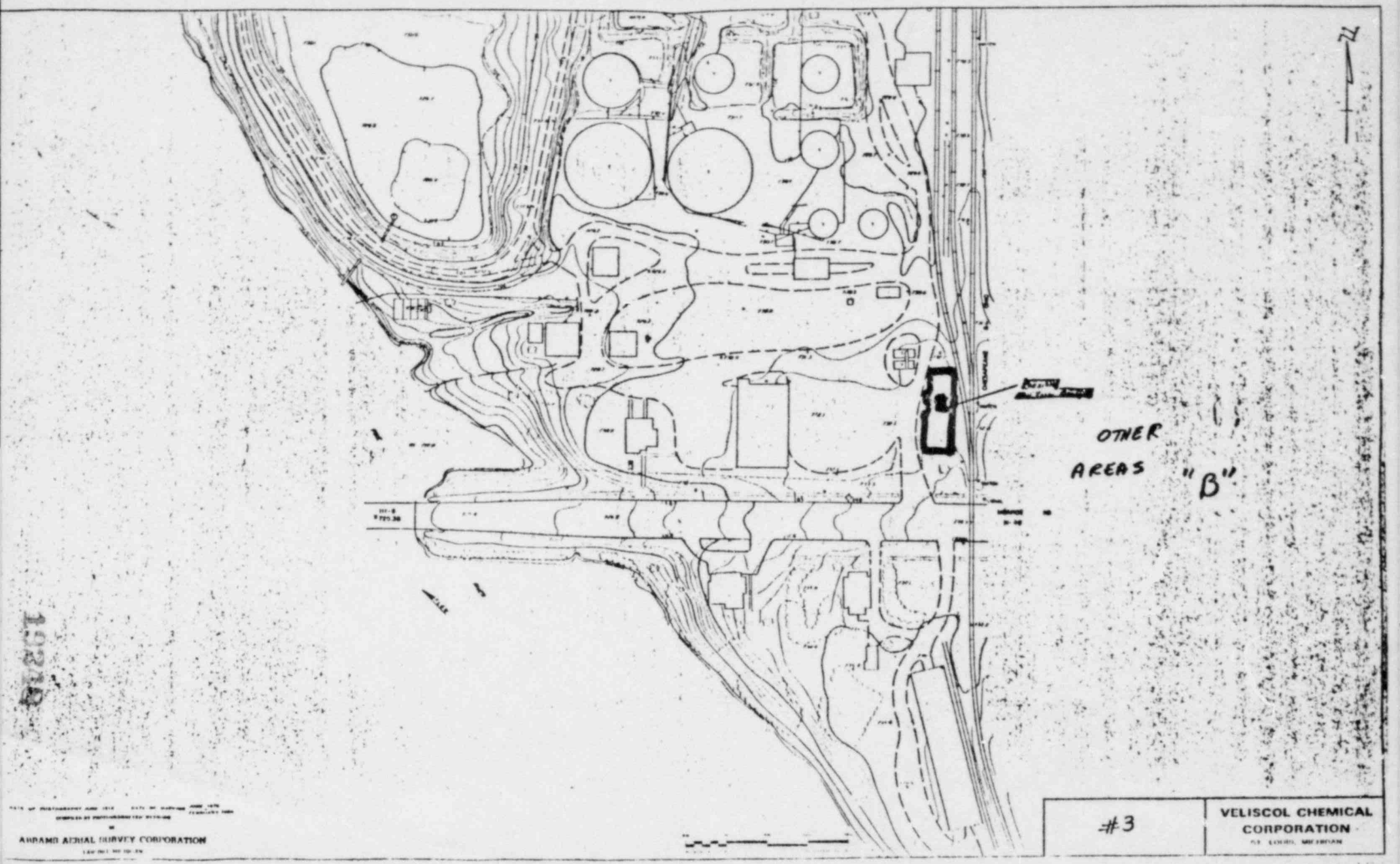


Other Areas "B"

ABRAMS AERIAL SURVEY CORPORATION

#2

VELISCOL CHEMICAL CORPORATION


OTHER
AREAS "B"
#3
VELISCOL CHEMICAL
CORPORATION
ABRAMS AERIAL SURVEY CORPORATION

Addendum To

Comprehensive Survey and Decontamination Plan

Submitted July 15, 1980

Velsicol Chemical Corporation

St. Louis, Michigan

Table of Contents

1. Background Information

The rare earth products were produced from purchased rare earth concentrates by an ion-exchange process. Operations began in 1957 and continued until 1959 in a facility owned by the United States Government and operated under contract by the Michigan Chemical Corporation. Demand for rare earth products dropped off in 1959 and the facility was shut down. There was only occasional developmental quantity interest during the next four years. Michigan Chemical purchased the facilities from the U.S. Government during this period.

Commercial interest in the rare earth oxides increased in 1963 and by 1964 the plant was restarted using existing feedstocks. By 1966, the feedstock concentrates available commerically or through the General Services Administration had been used up. New sources of concentrate were less pure and needed upgrading in yttrium content to be usable ion-exchange feed.

From time to time, Michigan Chemical extracted yttrium oxide from the feedstocks in a pilot plant during and after June, 1965. The primary purpose of the pilot plant was to evaluate feedstocks and extraction (upgrading) processes for the rare earth process. Extraction in commercial quantities was accomplished from 1967 through approximately April, 1968 and from September, 1969 to March, 1970.

The Rare Earth Plant consisted of two operations, the extractor system and the ion-exchange column system. The extractor system was utilized for upgrading the low quality rare earth concentrates to a quality level which could be efficiently loaded onto the ion-exchange columns. The ion-exchange columns performed the final separation of the rare earth components. Fractions from the ion-exchange columns were screened and blended with other fractions to make up customer material.

Processing of Rare Earth feed material was performed in three buildings on the plant premises. These buildings, the Rare Earth Processing building, the feed plant and the Pilot Plant (Research Lab), are included in the areas designated "C" on the maps contained in the survey and decontamination plan submitted on July 15, 1980.

2. Health Physics Procedures

Health Physics procedures utilized during the survey and decontamination effort will be accomplished using workers' operating procedures and radiation safety techniques which have been reviewed and approved by the NRC.

2.1 Personnel

The personnel to be utilized in the survey and decontamination will include one radiological physicist, one industrial hygienist, the plant manager, and necessary assistance of both technical and labor support. The training outlined in section 2.3 will be given to all personnel involved in the decontamination effort.

2.2 Personnel Monitoring

2.2.1 Film Badge Monitoring

All personnel working in the plant site area, controlled area, will be issued a film badge for total body monitoring of dose. The whole body badge will be by R.S. Landauer Co. and will be a G1 type badge. For personnel actually performing the decontamination, there will be wrist badges issued. These wrist badges will also be provided by R.S. Landauer film badge service. Used badges will be returned to R.S. Landauer for processing and results will be returned to Velsicol Chemical Corporation for the files. The badges are set up on a monthly basis, but the badges will be processed and ordered as needed.

2.2.2 Air Sampling

Air sampling will be performed to determine potential employee inhalation exposure to radioactive dust during the decontamination activities. Each employee's exposure will be monitored during one-third of the work shifts (or a minimum of three shifts) in which he is involved in decontamination activities. The sampling device will be attached to the worker's collar or lapel to obtain representative breathing zone samples.

The pumps used to draw air through the filtering device will be MSA brand Model S and Model G pumps. The pumps will be calibrated at the flow rates used during the monitoring (approximately 1.8 liters per minute) utilizing a Kurz Model 541 mass flow meter.

The filter used for sample collection will be a Millipore Type AA 0.8 micron pore size filter. The filter shall be held in place by a plastic filter cassette and connected to the pump with tygon tubing.

The sample filters will be analyzed by a gas flow counter for gross alpha, beta and gamma. A blank filter (handled in the same manner as the samples except that no air is drawn through it) will be submitted for analysis as will a "zero" filter (this filter will not be transported to, or have any contact with the St. Louis facility).

2.3 Personnel Training

Personnel will be given training in regard to decontamination and use of radioactive materials. This training will include radiation safety measures and terms used in health physics. A brief outline of this training will be as follows:

A. State of Michigan "Notice to Employees" (where posted)

B. Characteristics of x and gamma radiation

C. Units of radiation dose

D. Levels of radiation from sources to be used

E. Methods of controlling exposure

1) Working time

2) Working distance

3) Shielding

4) Personal Protective Equipment

F. Use of personnel monitoring

1) Film badges

2) Permissible limits for occupational workers

2.4 Personal Protective Equipment

The personal protective equipment which will be issued to and used by employees performing decontamination work is as follows:

A. MSA brand "Nuclear" coverall with hood and high top boots. These are constructed of Tyvek material, have a FRAZIER air permeability of less than 1.0, and are equipped with pressure sensitive tape closures.

B. MSA brand fully coated vinyl plastic gloves.

C. MSA brand, Comfo II model respirators (NIOSH/MSHA approval number TC23C-161) equipped with MSA GMA-H combination filter/cartridges (NIOSH/MSHA approval number TC23C-155). The cartridges have been approved for respiratory protection against; a) not more than 1000 ppm organic vapors, b) dusts, fumes and mists with a TWA less than 0.05 milligram per cubic meter, and c) radionuclides. Employees will receive instructions on how to perform a qualitative fit test to insure a proper seal is obtained between the face and respirator face-piece.

2.5 Personal Hygiene Practices

Employees shall be instructed to observe the following personal hygiene practices during decontamination activities:

A. Prior to entering the lunchroom, all protective equipment shall be removed. Tools and/or protective equipment shall not be allowed to enter the lunchroom. Face and hands shall be washed with soap and water prior to eating or drinking.

B. At the end of the work shift, employees shall remove and discard coveralls, boots, gloves and respirator cartridges in the container provided. The discarded materials shall be considered contaminated and ultimately disposed of with other decontamination waste.

C. Employees will be required to shower at the end of each work shift. After showering, the employees will be checked for contamination with an appropriate survey meter and the cleaning process repeated if contamination

is detected. (Details of this procedure can be found in section 2.6.4 of the proposal).

D. Respirator facepieces shall be assigned to specific individuals and instructions will be given in the cleaning and maintenance of the respirator. Each employee shall clean his respirator facepiece at the end of the shift and fresh respirator cartridges will be installed at the beginning of the next shift.

2.6 Personnel Protection Surveys

Surveys associated with personnel protection will be performed daily.

2.6.1 Areas such as change rooms, showers, and offices where employees would be during decontamination effort will be smeared daily for indication of excessive amounts of removable contamination.

2.6.2 Smear samples will be over an approximate 100 cm^2 surface. Each smear will be counted for gross removable activity in the gas flow counter and well scintillation counter. Any readings greater than 200 disintegrations per minute will be considered contaminated and must be cleaned and re-smeared before release.

2.6.3 A smear test record will be kept for these personnel areas.

2.6.4 After protective clothing has been removed and before workers are allowed to leave the plant site, there will be a check for contamination of the employee. This will consist of a survey around the face, hands, shoes, cuffs, etc. This survey will be performed with a scintilla-

tion type survey meter on most sensitive scale, placed as close as possible without touching the area and moving the probe slowly over the surface. If there is an indication greater than normal background, contamination is assumed to be present. If contamination of the skin is indicated, the individual will be asked to wash with warm water and mild soap prior to remonitoring. If contamination is still present, the affected portion of the individual will be rinsed in clear water. After the area is dry, remonitoring will occur. If contamination is still present, the process will be repeated beginning with the individual washing the affected portion with mild soap and warm water, drying, and remonitoring. Washing will be repeated as necessary until no contamination is indicated.

If contamination of personal shoes is indicated, the contaminated location will be brushed with paper towels. After remonitoring, if contamination is still present, the individual will be asked to wash the affected portion with mild soap and warm water. After the area is dry, remonitoring will occur. Washings will be repeated as necessary until no contamination is indicated.

For additional decontamination information, refer to pages 194-203 of Radiological Health Handbook.

2.6.5 A log book and/or records will be maintained of all monitoring data including exposure records, state-

ment regarding surveys or personnel at end of work day, and smear samples.

2.7 Health Physics Instrumentation

The health physics instrumentation utilized is explained throughout the proposal, however, the suggested list is as follows:

A. Model 19 Micro R meters - Ludlum Measurements Co. - calibrated to energy range near suspect contaminates. (Thorium daughters)

B. Alpha and Beta sample counting equipment - Nuclear Measurements Corporation #2607 or similar type equipment.

C. Well type scintillation detector and scalar for gross gamma detection.

3. Radiation Survey of Plant Site

3.1 Survey Instrumentation

The equipment used in the survey will be purchased or leased by Velsicol Chemical Corporation specifically for this survey and decontamination effort.

3.1.1 External Detection

External detection of radiation will be by survey type equipment. The equipment proposed for this type of survey over grid intersections will be NaI type survey meters with indications in micro R/hr. The Ludlum Measurements Model 19 R meter calibrated for energy dependence is being considered. This instrument or comparable instrument will be used to measure the exposure rate levels one meter above the surface. Background readings will be recorded in several sites, both on and off the plant site.

3.1.2 Smear Soil, and Liquid Samples

Radiation levels in smear samples, soil samples, and water samples will be collected and prepared for counting in a laboratory type environment. Gas flow counting techniques will be utilized for smear samples. The gas flow system being considered is the Nuclear Measurements Corporation #2607 with $1mg/cm^2$ and 0.1 mg/cm Mylar window. All smear samples will be counted on a system like this for gross alpha and gross beta activity in accordance with the NRC proposed guidelines. Gross gamma activity for smear samples will be measured with a well type scintillation counter. The disintegrations per minute of calibrated sources will be conducted on all lab instrumentation. Assistance will be sought in preparation of soil and water samples, and some split samples will be prepared and counted in an independent commercial laboratory for comparison.

3.2. Units of Measurement

All units utilized for the survey and decontamination will be consistent with previously published reports. Any readings not specified directly as "real unit" value will be clarified by including efficiency of instrumentation or conversion to an accepted unit value.

3.2.1 External Exposure Units

All absorbed dose values for personnel employed in the survey and decontamination plan will be recorded in units of millirem as reported by the film badge service. External exposure rate values used to survey the grid

intersections and inside structures will be recorded in terms of microrem/hour or millirem/hour. The quality factor for the radiation will be considered as 1.0. Readings will be recorded based on a calibrated survey meter.

3.2.2 Soil, Water and Air Units

Concentration levels in soil, water, and air will be recorded as picoCuries/gm and picoCuries/liter, respectively. Any readings which might be recorded as disintegrations per minute will include a means of conversion to the units mentioned.

3.3 Specific Plant Division Based on Material Usage

The plant site is divided into 3 general areas based on the plant operations. Area A is an area on which no radioactive material was used, transported, or stored. No readings above expected background readings are expected in this area. Area B is similar to Area A except for the roadways or railways. Radioactive material was transported across Area B via the road or rail routes to Area C. Area C is suspect of having radioactive contamination either in the manufacturing process area or in stored areas. Each area will be surveyed and decontaminated according to the following release levels.

3.3.1 Area A

Objectives and release levels are proposed for Area A. The plan for Area A will consist of a 50' x 50' grid superimposed over the entire area. Readings will be made at each grid intersection which falls in an open area. All grid intersection points which fall within a building or tank structure will be noted and referenced to the survey

of that particular building or tank. All buildings within Area A will be surveyed separately and readings on an internal grid will be recorded on a diagram of that particular building. Grid sizes for buildings in Area A will vary depending on the size of the building, but no less than 4 external exposure rate readings will be taken and smear samples will be taken for the floor or floors and the walls of all buildings. Tanks in Area A will be surveyed by a peripheral survey taking average readings and at least 2 internal readings recorded. A sample will be taken inside all tanks of any residue or a smear sample, or both. All tanks will be identified by specifying a tank number and some description of the tank.

Any grid intersection point in an open area which has a reading in excess of 20 microrem/hr (12 microrem/hr. above background) at 1 meter from the surface will be considered as contaminated and a smaller grid will be constructed around the higher reading point to assess the extent of the contamination.

To determine soil or water concentration, 10% of all open grid points will be sampled. The open grid points will all be numbered and sampling points for concentrations will be selected at random, using a table of random numbers. Any soil concentration values in excess of Table A will be considered as contaminated and decontamination of

the area will proceed following the total survey.

Smear samples inside buildings or tanks which have readings higher than those proposed in Table B (guidelines proposed by NRC) will be considered as being contaminated and additional samples and a more intensive survey of that building or tank will be made to determine the extent of the contamination. For buildings, interior surfaces, and any areas not included as open areas, surveys and smear samples will be made at drain lines, traps, and other appropriate acess points.

3.3.2 Area B

Area B will be included in a 50' x 50' matrix as Area A, except for the roadways and railways. The same survey plan for Area A will be extended to Area B except for scanning of transport routes used for radioactive materials. Transport routes will be scanned with grid points recorded based on 25' lengths and each route divided into two-way scanning. This would results in not only a walk over scan, but recording the reading every 25' and repeating this for each half of the width of the transport route.

Soil samples or smear samples will be taken for 10% of all readings. The 25' marked points will be numbered and sampling points will be chosen at random based on a random number table. Any

exposure area found to be in excess of 12 microrem/hr. above background at 1 meter from the surface will be considered as a contaminated area. Any soil samples or smear samples in excess of values listed in Table A or Table B, respectively, will be considered as contaminated and good health physics practices will be used to decontaminate to accepted guideline levels. Better definition of the extent of the contaminated area will be achieved by a smaller grid over the area of increased reading.

3.3.3 Area C

Area C is considered to be an area of suspect contamination. Some of the areas in "C" are known contaminated areas based on previous scoping surveys by the NRC. Grid sizes for Area C will be 20' x 20' for outside open areas. Readings will be recorded for each grid intersection point at 1 meter from the surface. Readings in excess of 12 microrem/hr. above background will be considered as excessive and the area will be noted as contaminated.

All buildings and tanks within Area C will be assumed to contain some contamination. Each building and tank will be considered separately and a diagram indicating survey points, and smear sample points of the interior surfaces will be provided with the survey report. The necessity for decontamination will be based on the Guidelines

for decontamination provided by the NRC. Several soil or water sampling points will be made within open areas of Area C. This will be a minimum 10% of all grid points. More sampling points will be taken to assist in the evaluation of the extent of the contamination. Smear samples of interior surfaces will be made on a floor grid depending on the building size, with a minimum of 4 sampling points for smaller buildings. Smear samples will also be taken near traps, drains, lower areas, walls, and any area suspect of being contaminated. All readings will be recorded in units of microcuries or dpm with area or smear marked on the attached diagram. With these three areas included in the survey, and appropriate grid sizes as noted, we feel the survey report to be very comprehensive and the likelihood of missing a contaminated area will be remote.

4. Operating Procedures for Decontamination

Every reasonable effort will be made to eliminate residual contamination which is found as a result of the comprehensive survey.

4.1 Decontamination of Open Areas

In the Companies' view, the levels stated in Table A are very conservative and may prove impracticable if large areas of soil exceed those levels. If this proves to be the case, the company will discuss further what decontamination measures are appropriate under the circumstances. Decontamination of open areas where

radioactive material is found in the soil will consist, where feasible, of repackaging of soil in 55 gallon drums until the levels are below those proposed in Table A. Health physics procedures for this decontamination will be as discussed in section 2 of this proposal. Materials to be shipped to the disposal site will be packaged in accordance with DOT regulations for shipment via Atomic Disposal Service, Inc., Tinley Park, Illinois, as broker to a licensed commercial burial site (probably Richland, Washington).

4.2 Decontamination of Buildings

Decontamination of buildings will consist of washing contaminated surfaces with water and detergent and obtaining smear samples after washing. Any waste generated by the decontamination process will be collected and considered as radioactive for packaging and shipment to licensed burial site. Contaminated areas which might pose special decontamination problems will be washed with strong detergent, sand blasted, or chipped and scraped as needed. Personnel protection for this decontamination is explained earlier in this proposal.

Survey readings and smear samples will be taken after each washing to insure level of contamination is below that listed in TableB.

4.3 Decontamination of Tanks

Decontamination of tank surfaces will consist of washing with strong detergent until the smear sample over the contaminated area is below the dpm level proposed in Table B. If the tank cannot be decontaminated by washing due to excessive corrosion of the interior, then scraping of the interior surface or sanding will be performed as needed. Proper precautions for personnel protection will be followed during this type of decontamination (See section 2.0).

4.4 Decontamination of Other Equipment

Details of the survey and smear samples for equipment, pipes, drain lines, etc., will be provided in the survey report. Those found to be contaminated will be washed in detergent and/or scraped and a second smear sample taken to insure removable contamination is below that listed in Table B. Any equipment, pipes, etc., sufficiently small to be placed in 55 gallon drums might be disposed of totally if the decontamination effort would result in a considerable time or cost.

4.5 Disposal of Waste

Any material used in decontamination, such as washings and detergents, gloves, protective clothing, scraping tools, and other supplies will be considered as contaminated waste material. This waste material will be packaged in accordance with DOT regulations for shipment to a licensed burial site.

5. Records

All necessary records will be maintained at Velsicol Chemical Corporation for inspection by the NRC.

5.1 Personnel Monitoring Records

Records of the employee exposure monitoring notifications and smear sample data shall be included in the final survey report. Employees will be advised of their individual exposure measurements. The following air sampling data will be recorded and contained in the final report:

a. Employee name
b. Employee social security number
c. Date of exposure monitoring
d. Duration of sample period
e. Volume of air sampled
f. Results of analysis
g. Concentration (expressed in microcuries per milliliter of air).

A brief description of the employee's activities during the monitoring period as well as a description of the analytical procedure will be recorded.

5.2 Open Areas

Open area grid exposure rate data will be kept in files and provided in the survey report to the NRC.

5.3 Buildings/Tanks

Buildings and tanks will be reported on separate sheets with indications of survey and sample points with readings

at these points.

5.4 Equipment/Removable Items

Equipment or other removable items which will be released for unrestricted use will be reported based on the survey data. Very large equipment which might be suspect of contamination due to its plant use will be tested with smears before release.

6. Waiver of Limits

Waiver of limits is requested due to natural radioactive materials in bricks of some buildings and along the shoreline of the Pine River. A test has been conducted on the bricks found along the Pine River and the bricks were found to contain the same quantity of radioactive material as bricks stored on the plant site. It should also be noted that some buildings contain these or similar bricks with surface exposure rates in excess of 20-25 microrem/hr. It is requested that these bricks in the buildings, shoreline bricks, and stored bricks be excluded from the exposure rate limitations specified earlier.

7. Salvagable Equipment

Equipment which has been determined to be contaminated will be decontaminated to the levels specified in this plan. If, in the future, Velsicol were to sell said equipment, even though the de minimus levels were met, limitations as to further use will be placed on the equipment such that it would not be used in food processing or related applications. Velsicol will record such a limitation on use in the equipment sale document.

TABLE A

Release Levels For Soil In Picocuries Per Gram

Radionuclide	Soil Concentrations (pCi/gm)
U-238	35.0
U-235	32.5
U-234	30.3
Th-232	23.1
Th-230	31.0
Th-228	10.4
Ra-228	12.4
Ra-226	5.0

TABLE B

Acceptable Surface Contamination Levels

Nuclide	Average	Maximum	Removable
U-nat, U-235, U-238, and associated decay products	5,000 dpm a/100 cm^2	15,000 dpm a/100 cm^2	1,000 dpm a/100 cm
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100 dpm/100 cm^2	300 dpm/100 cm^2	20 dpm/100 cm^2
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1000 dpm/100 cm^2	3000 dpm/100 cm^2	200 dpm/100 cm^2
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.	5000 dpm By/100 cm^2	15,000 dpm By/100 cm^2	1000 dpm By/100 cm