4401-INDUS-1979

* Permit Application, Site Six, 3/18/83, Rcvd. Aug. 4th, 2003

SOLID WASTE
PERMIT APPLICATION
SANITARY LANDFILL
SITE SIX

Carmen Johnson
Doc ID#
4401
Date
~~3/26/12~~
4/4/12(g)

Champion International

Champion®
Champion International Corporation
Paper Division

INFORMATION FOR APPROVAL

of

SANITARY LANDFILL SITE 6

SITE INFORMATION,

OPERATIONAL PLANS AND REPORT

March, 1983

Champion International Corporation

Paper Division

Canton Mill

Canton, North Carolina

TABLE OF CONTENTS

GENERAL INFORMATION

Champion Papers, Champion International Corporation, Operates an integrated pulp, paper and paperboard mill at Canton, North Carolina. Fourteen miles west, near Waynesville, Champion operates a sheet converting plant and a polyethylene extrusion coating operation for putting plastic coating on milk carton stock.

Current Canton Mill production is approximately 1,400 tons of pulp per day and 1,580 tons of paper and foodboard each day. The Mill operates 24 hours daily, seven days a week. A total of 2,342 are employed at Canton and Waynesville. Of this number, 2,061 are at the Canton Mill.

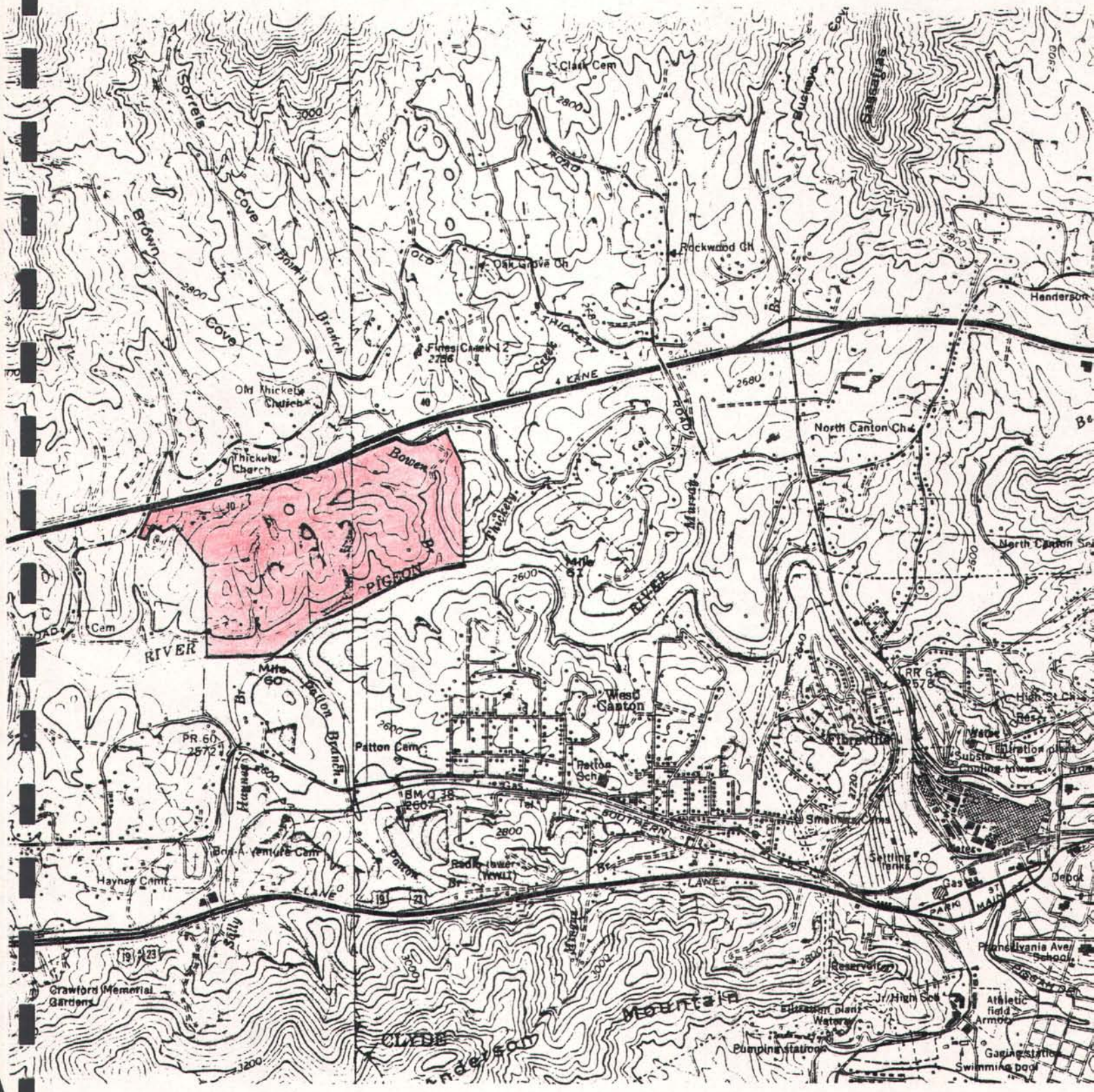
Manufacturing operations at the Canton Mill include: Steam and electric power generation facilities, pine and hardwood pulp mills using the sulphate chemical process, multistage bleaching systems, chlorine production facilities, five paper machines, one foodboard machine, sheeting, trimming and packing equipment, warehousing and shipping facilities. The chemical recovery operations consist of multiple effect evaporators, two recovery furnaces, two lime kilns and cooking chemical preparation facilities.

The Mill generates large quantities of solid wastes from primary and secondary waste water treatment facilities, fly ash from three coal burning boilers, cinders from a combination coal-bark burning boiler, excess lime sludge, bark and small quantities of other miscellaneous materials. All solid wastes are hauled by truck from the mill area to landfill sites located three to four miles from the Mill.

Site Information

SANITARY LANDFILL SITE 6

CHAMPION INTERNATIONAL CORP.
Paper Division
Haywood County
Canton, North Carolina

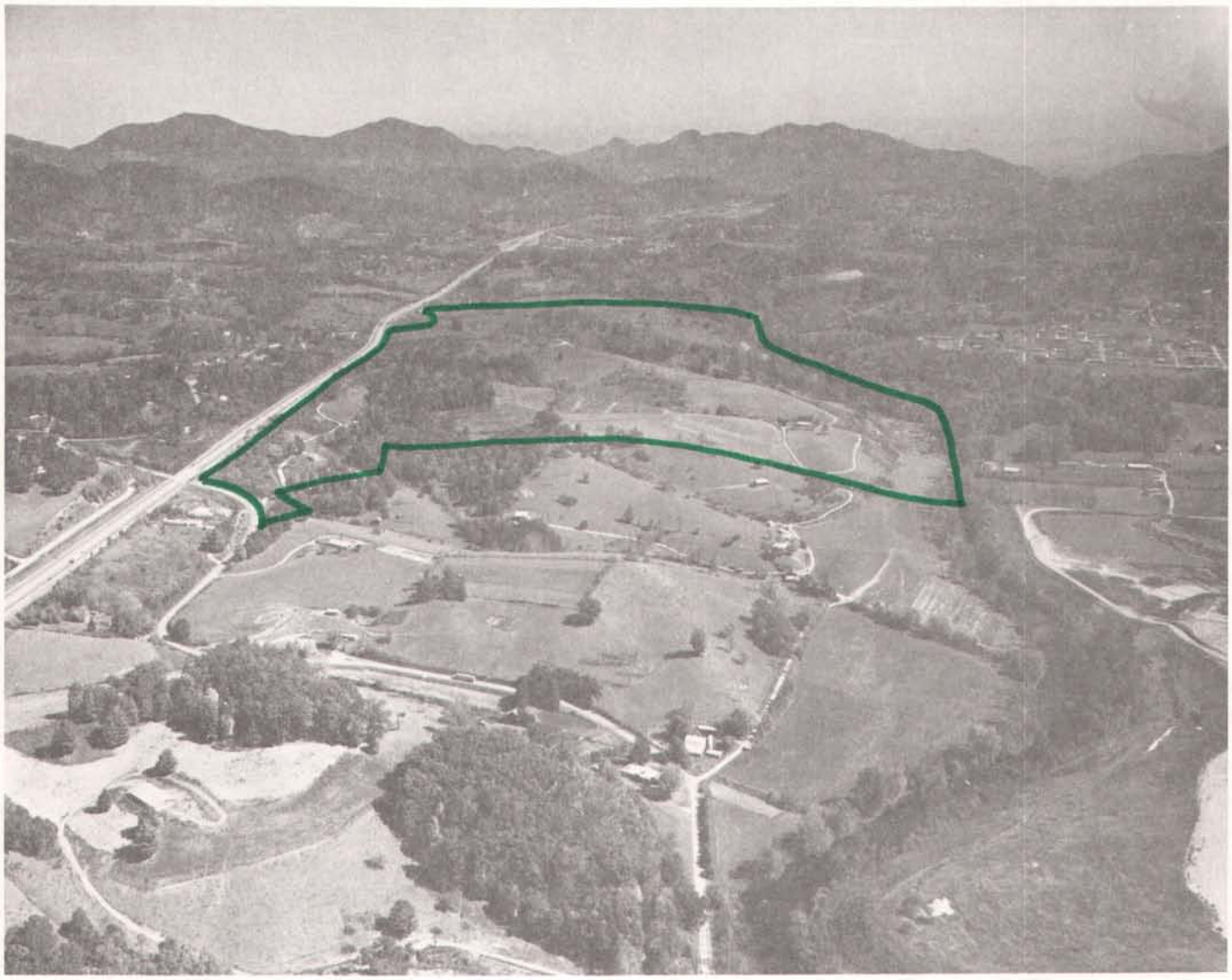


Drawing Under Seperate Cover

SANITARY LANDFILL SITE 6

Champion International Corp.
Paper Division
Canton Mill
Haywood County
Canton, North Carolina

Aerial View of Site 6 - Looking in an Easterly Direction

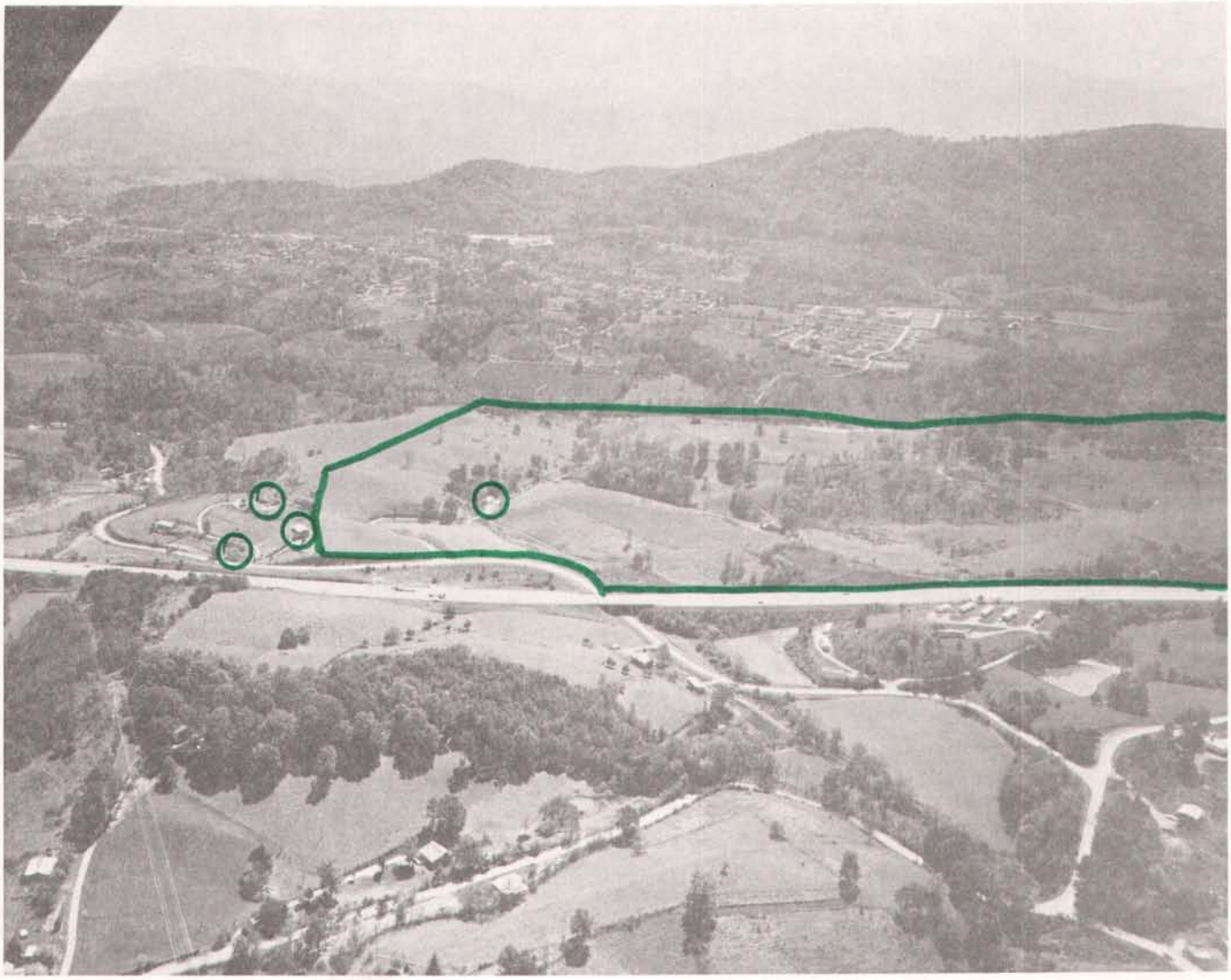


Legend: — Approximate Boundary of Property owned by Champion International Corp.

SANITARY LANDFILL SITE 6

Champion International Corp.
Paper Division
Canton Mill
Haywood County
Canton, North Carolina

Aerial View of Site 6 - Looking in a Southerly Direction



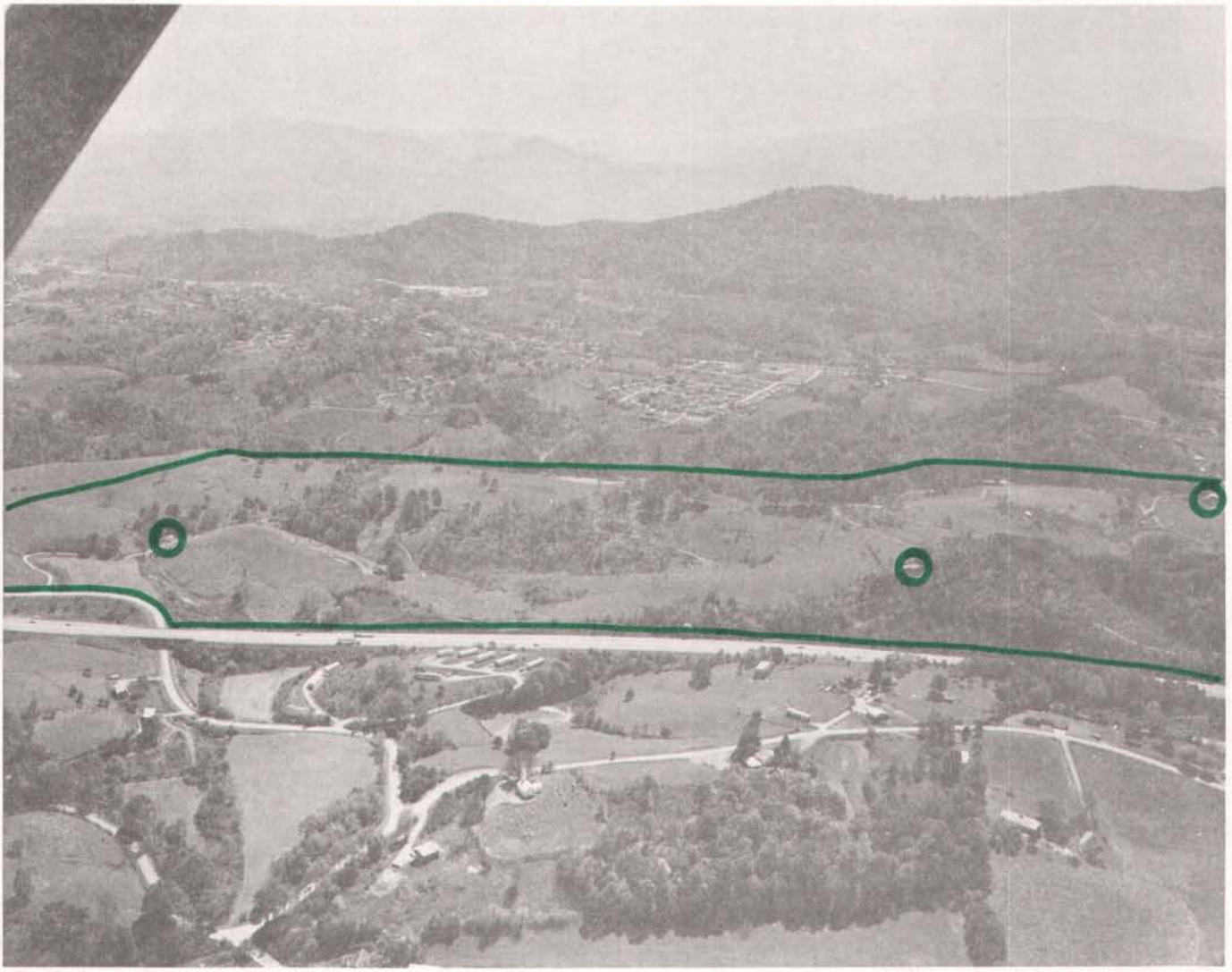
Legend: — Approximate Boundary of Property owned by Champion International Corp.

○ Location of Homes

SANITARY LANDFILL SITE 6

Champion International Corp.
Paper Division
Canton Mill
Haywood County
Canton, North Carolina

Aerial View of Site 6 - Looking in a Southerly Direction



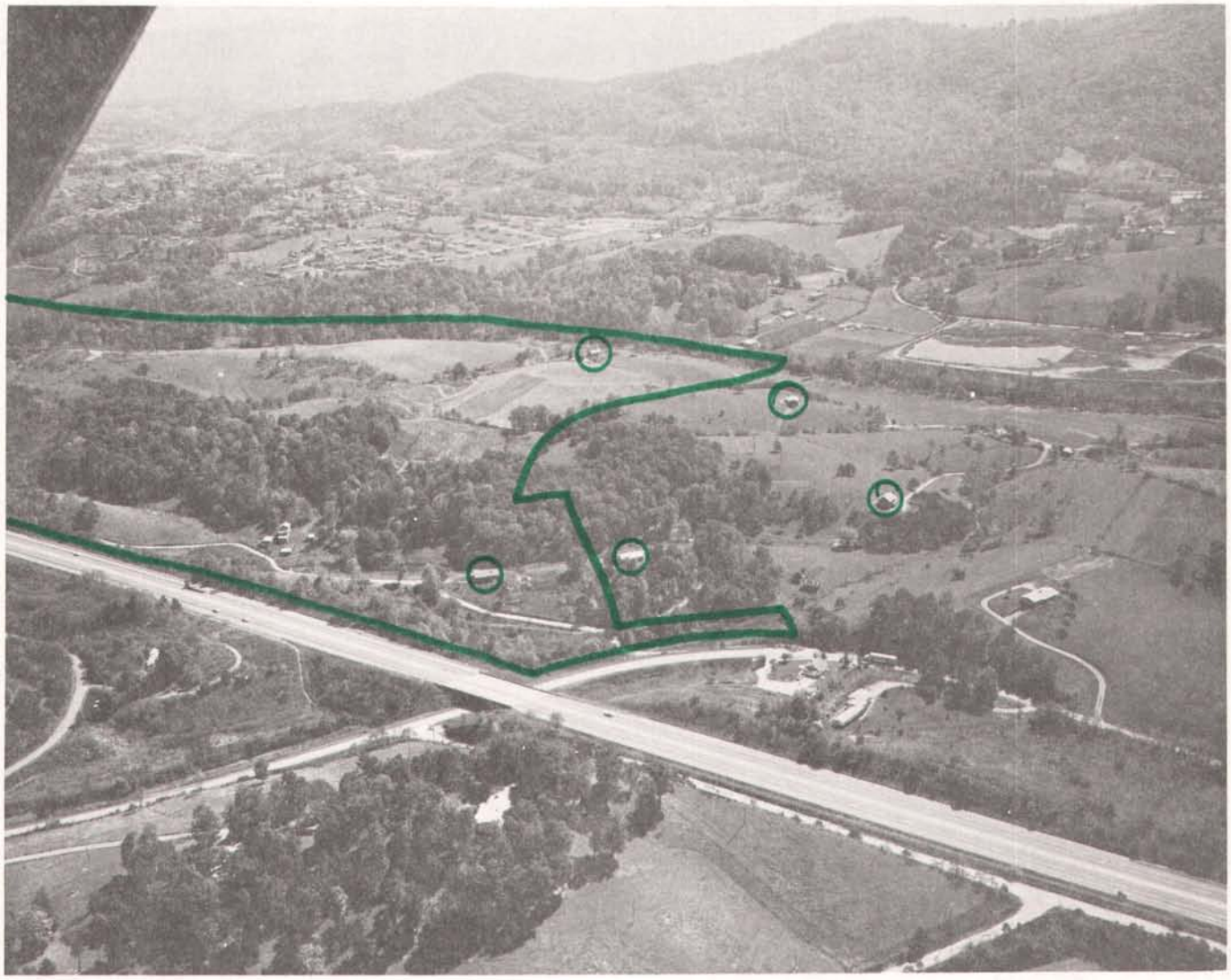
Legend: — Approximate Boundary of Property owned by Champion International Corp.

O Location of Homes

SANITARY LANDFILL SITE 6

Champion International Corp.
Paper Division
Canton Mill
Haywood County
Canton, North Carolina

Aerial View of Site 6 - Looking in a Southeasterly Direction



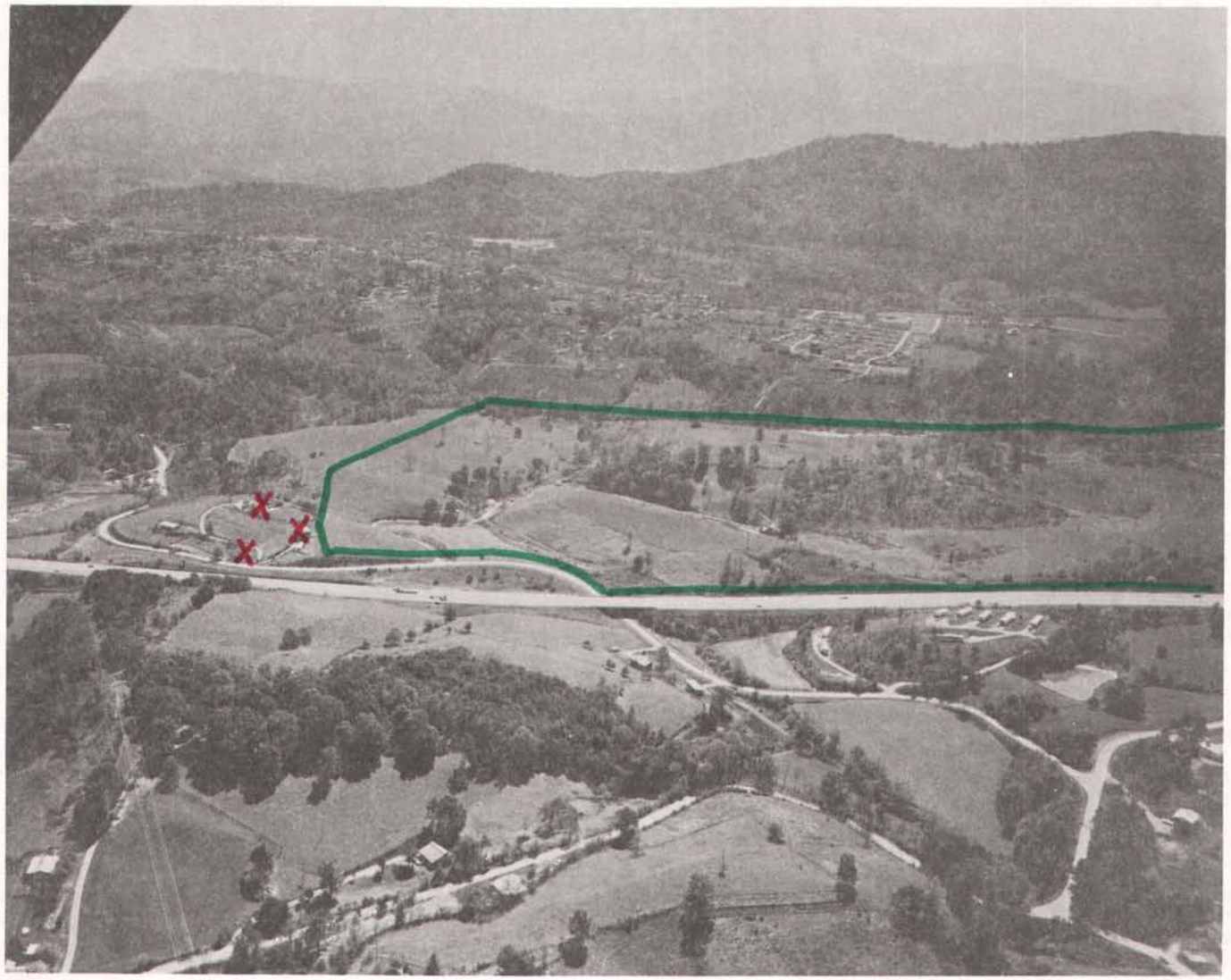
Legend: —— Approximate Boundary of Property owned by Champion International Corp.

○ Location of Homes

SANITARY LANDFILL SITE 6

Champion International Corp.
Paper Division
Canton Mill
Haywood County
Canton, North Carolina

Aerial View of Site 6 - Looking in a Southerly Direction



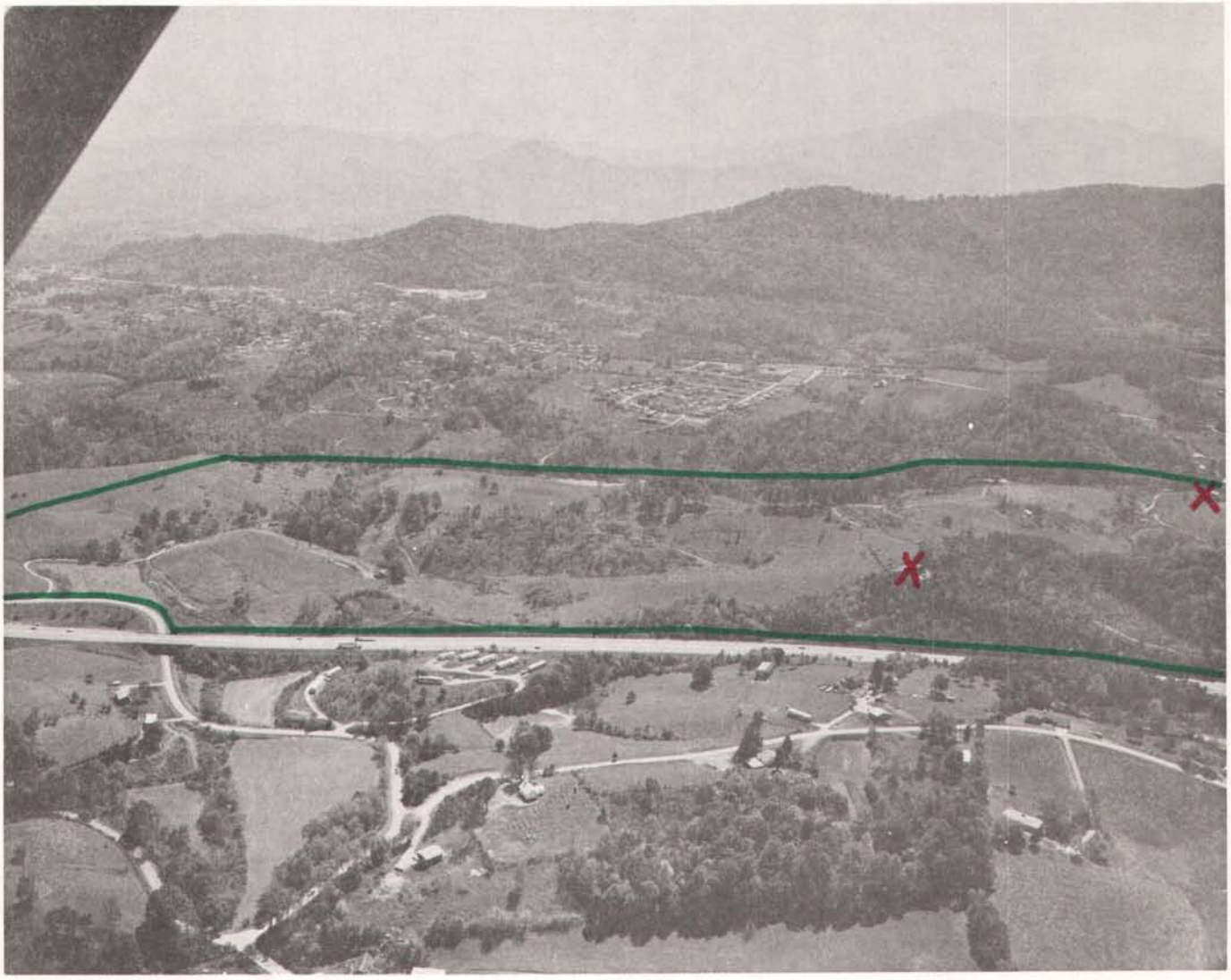
Legend: — Approximate Boundary of Property owned by Champion International Corp.

X Location of Wells

SANITARY LANDFILL SITE 6

Champion International Corp.
Paper Division
Canton Mill
Haywood County
Canton, North Carolina

Aerial View of Site 6 - Looking in a Southerly Direction



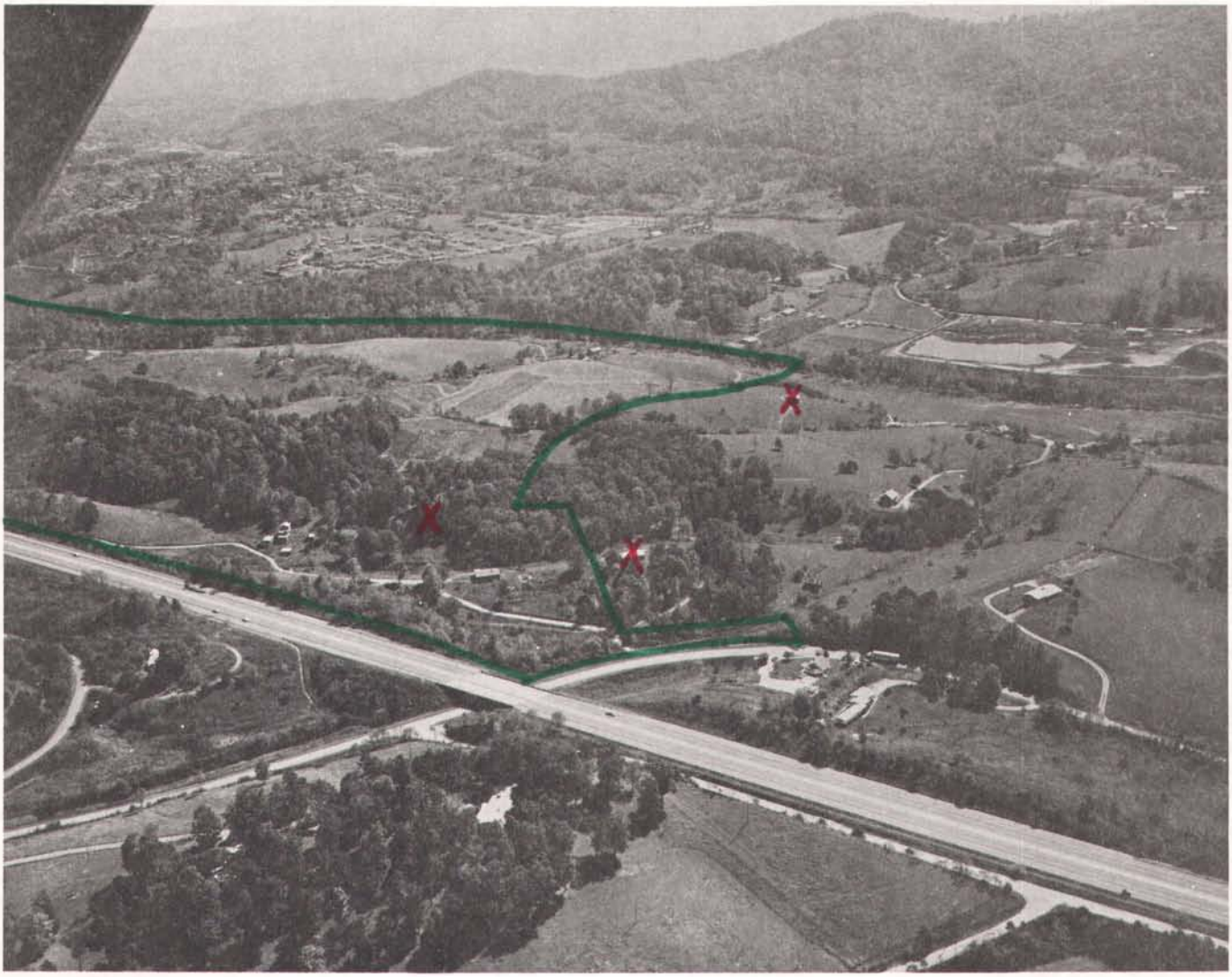
Legend: — Approximate Boundary of Property owned by Champion International Corp.

X Location of Wells

SANITARY LANDFILL SITE 6

Champion International Corp.
Paper Division
Canton Mill
Haywood County
Canton, North Carolina

Aerial View of Site 6 - Looking in a Southeasterly Direction



Legend: — Approximate Boundary of Property owned by Champion International Corp.

X Location of Wells

HAYWOOD COUNTY
BOARD OF COMMISSIONERS

September 30, 1981

Mr. R. M. Phillips, Supervisor
Communications and Community Relations
Champion Papers
Canton, North Carolina 28716

Dear Bob:

Re: Thickety section property for Additional Landfill Site for Champion Papers

After careful review of the proposed landfill site for Champion Papers in Canton, located in Haywood County, the Haywood County Board of Commissioners cannot find any reasons why the site should not be approved.

The official approval of the additional landfill site is recorded in the minutes of the Haywood County Board of Commissioners, dated September 8, 1981.

If we can be of further assistance, feel free to contact the Haywood County Board of Commissioners.

Sincerely,

Ed Russell

Edwin Russell, Chairman

pd

HAYWOOD COUNTY
BOARD OF COMMISSIONERS

February 2, 1982

Mr. R. M. Phillips, Supervisor
Communications and Community Relations
Champion Papers
Canton, North Carolina 28716

Dear Bob:

The Haywood County Board of Commissioners at its regular meeting of February 1, 1982 officially approved your request for the additional 4.127 acre tract of land to be used for landfill purposes. Said land being located adjacent to the 230.924 acre tract of land known as your proposed landfill site #6 in the Thickety section of Haywood County.

Sincerely,

Edwin Russell, Chairman
Haywood County Board of Commissioners

ER:pd

WEBB A. MORGAN & ASSOCIATES, P.A.

REGISTERED LAND SURVEYORS
P. O. Box 7263, Asheville, North Carolina 28807

Webb A. Morgan, RLS
President

Gerald W. Stevenson, RLS
Vice President

February 23,1882

Larry Griffin
Champion Papers
Canton, N.C. 28716

Dear Mr. Griffin,

In regard to our telephone conversation February 23,1982, The vertical datum is based on sea level. The bench mark used was North Carolina Geodetic Station "Culvert" Elevation 2704.29 feet above mean sea level. Data was furnished to us by N.C.G.S. office in Raleigh, N.C.

Very truly yours,

Webb A. Morgan

Webb A. Morgan & Associates,P.A.

Underdrain System and Site Flood Considerations Were Investigated by Law Engineering Following a Site Visit by Mr. Gordon Layton.

LAW ENGINEERING TESTING COMPANY
geotechnical, environmental & construction materials consultants
501 MINUET LANE
P.O. BOX 11297 • CHARLOTTE, NORTH CAROLINA 28220
(704) 523-2022

January 18, 1982

Champion Papers
Canton Mill
Canton, North Carolina 28716

Attention: Mr. Larry Griffin
Supervisor of Environmental Control

Subject: Underdrain System and Site Flood Considerations
Landfill Number 6
Champion Papers
Canton, North Carolina
LETCo. Job No. CH 4507

Gentlemen:

As requested by Mr. Larry Griffin of Champion Papers, we have expanded our discussion of the proposed underdrain system to control on-site springs and the projected flood conditions of the adjacent Pigeon River for Champion Landfill Site No. 6. Our authorization for these services is your Purchase Order Number 84765 dated October 8, 1981. This narrative and the data presented herein should serve as a complement to our report of May 28, 1981 and should be considered in the context of it.

Underdrain Systems

Several on-site springs form small creeks in wet drainage features (WDF) II, III and IV (see attached Drawing No. 10). During the field exploration of this site (spring and summer 1980), the volume of water discharging from the individual springs was relatively low. During and since beginning the exploration, rainfall has been below normal. Thus, the spring flows observed during our exploration are probably below the rates which would occur after periods of increased precipitation. Actual field measurements of spring discharge rates have not been made but would be required for design of a specific underdrain. The springs appear to have been at their present locations for a substantial period of time. This locational stability suggests that the seepage channels are well developed, lessening the chance that seepage might reroute itself during construction.

Several methods of collecting and routing the spring water through the landfill area are feasible. However, we recommend the use of granular underdrains (constructed of natural materials) placed in existing creek channels. The recommended type of drain would consist of a blanket of wash stone surrounded by a graded sand filter and separated from the landfill bottom by a minimum of 5 ft of compacted soil. The use of natural materials would minimize the need for future maintenance of the drains. The springs would be intercepted at the seep locations and the collected water would be routed through the granular drains to a location outside the disposal areas. The spring water in the underdrains would now be analogous to groundwater in an aquifer.

The drain at each spring location must be designed for the specific parameters of that individual spring. The pertinent parameters for drain design are:

q = design maximum spring flow (cfs)
i = average slope of drain (ft/ft)
k = permeability coefficient of drain gravel (ft/sec)
A_c = calculated cross sectional area of drain (ft^2)

The equation relating these parameters is $A_c = q/(ki)$. The maximum flow at each spring location will be based on actual field measurements. The average slope of the drains can be measured from available topographic maps. The permeability coefficient of the drain gravel can be determined from laboratory tests on the aggregate to be utilized. Knowing these three paremeters, the required cross sectional area of the drain can be calculated. A factor of safety of 10 is normally utilized for such subsurface drainage systems to compensate for potential increases in water capacity and potential clogging of portions of the drain. Thus, the design cross sectional area (A_d) of the drain is 10 times the calculated cross sectional area (A_c).

Although the gravel portion of the drain is sized based on a factor of safety of 10, one or more small diameter perforated pipes (PVC for corrosion protection) may be placed within the gravel for additional flow capacity and thus, an even greater factor of safety. The pipe(s) would be sized using Manning's formula:

$q = (1.49/n)AR^{2/3}S^{1/2}$ in which the parameters are:

q = maximum spring flow pipe can carry (cfs)
n = pipe roughness factor (ft^3sec)
A = cross sectional area of pipe (ft^2)
R = hydraulic radius (ft)
S = average slope of pipe (ft/ft) = i

The parameters n, A and R are dependent on the type and size pipe used, and S is dependent on the site topography.

The following example is presented to illustrated the above discussion of underdrain design. The assumed design is based on using ASTM No. 57 or No. 78 washed stone as the gravel material and an average slope of 5%, similar to the average slope in drainage feature WDF-II. The assumed design parameters for the gravel drain are:

$q = 10$ gpm $= 0.022$ cfs
$i = 0.05$ ft/ft
$k = 15$ cm/sec $= 0.49$ ft/sec

The calculated cross sectional area and the design cross sectional area of the drain is computed to be:

$A_c = q/(ki) = 0.90$ ft^2
$A_d = 10\ (A_c) = 9.0$ ft^2

Thus, it is computed that a gravel underdrain that has cross sectional dimensions of 2 ft thick and 4.5 ft wide will be adequate for the assumed design parameters.

Assuming that a 2-inch diameter perforated PVC pipe will be used for an additional factor of safety, the parameters are:

$n = 0.013$ ft^{3}sec
$A = 3.14$ sq in $= 0.022$ ft^2
$R = 0.50$ in $= 0.042$ ft
$S = 0.05$ ft/ft

The computed pipe capacity is:

$$q = (1.49/n)A\ R^{2/3}S^{1/2} = 0.067 \text{ cfs}$$

One 2-inch pipe would have a flow capacity 3 times the assumed maximum spring flow capacity. In all cases, we recommend that at least two pipes be utilized to minimize the impact should one pipe become damaged or clogged.

The gravel drain must be protected from clogging by soil particles that might be moved by the flowing water. This protection typically consists of a filter surrounding the gravel. Because of the infinite life span of the drains, we recommend that sand, a natural material, be utilized. The gradation of this filter sand must be compatible with the materials to be filtered, the cover soil and the washed stone of the gravel drain. Based on established gradation criteria for filters, the on-site soils to be filtered and drain gravel equivalent to ASTM No. 57 or No. 78 washed stone, concrete

sand (ASTM C 33) will probably be suitable for use as the filter material. The sand filter should completely surround the gravel and should be at least 8 inches thick to reduce the potential for disruption during construction.

The drain system should be placed on a relatively smooth surface with no abrupt changes in either horizontal or vertical directions. The surface should be prepared by removing any vegetation, organic debris and large rocks that might prevent a continuous flow path.

The gravel drain, surrounded by the sand filter, would be covered with compacted soil; the thickness of this soil cover would be at least 5 feet. Laboratory permeability tests have been performed on remolded samples of representative soils from the site. The laboratory permeabilities are on the order of 10^{-6} to 10^{-5} cm/sec for remolded samples. The samples were compacted to 95 percent of their maximum dry density as determined by the standard Proctor compaction test (ASTM D 698) at moisture contents that ranged from about optimum to 2 percent wet of optimum. Although most of the on-site soils may be satisfactory for use as the soil cover for the drains, we recommend that the more clayey (less permeable) soils be used for this purpose.

Site Flood Considerations

The Tennessee Valley Authority (TVA) publication "Floods on Pigeon River - Vicinity of Canton and Clyde, North Carolina" (February 1959) discusses past floods on the Pigeon River, past floods on streams in the area and the maximum probable flood on this reach of the Pigeon River.

According to this publication, the highest recorded flood on the Pigeon River in the Canton - Clyde vicinity during a period of about 150 years (since about 1810) occurred in late August 1940. The United States Geological Survey (USGS) has maintained records of stream-flow on the Pigeon River at Canton continuously from December 1928. At the gaging station in Canton, the gage elevation was 2593 for this late August, 1940 flood and the peak discharge was 31,600 cubic feet per second or 238 cubic feet per second per square mile of watershed area. Landfill Number 6 is located from about 3.5 to 4.3 miles downstream of the USGS gaging station. At this location, the Pigeon River has a drainage area of about 150 square miles and thus the peak discharge here for the late August, 1940 flood was about 35,700 cubic feet per second. The TVA publication estimates high water elevations to have ranged from 2555 at the east end of the Landfill Number 6 site to 2548 at the west end.

The largest known flood in this area prior to the late August, 1940 flood was in about 1810. This 1810 flood is estimated to have had a peak discharge of about 224 cubic feet per second per mile which is on the same order of magnitude as the late August, 1940 flood (238 cfs/sq mi).

The TVA publication asserts that

> "based only on a consideration of the maximum flood discharges that are known to have been experienced on streams in the Canton-Clyde region, it is reasonable to expect future floods in the order of 41,000 cubic feet per second at Canton and 45,000 cubic feet per second at Clyde".

Since Landfill Number 6 is about midway between Canton and Clyde, it can reasonably be inferred that future flood discharges of about 43,000 cubic feet per second will occur at the site. High water elevations are estimated to range from about 2557 at the east end to 2550 at the west end. These elevations are about 2 ft above those estimated for the late August, 1940 flood. We have conservatively considered this flood (high water elevation 2557 to 2550) as the estimated 100-year flood for site development purposes.

The maximum probable flood is based on a meteorological estimate of the physical limit of rainfall over the drainage area. In determining this limit of rainfall, consideration is given to the large storms and floods which have occurred on the Pigeon River and to those which occurred elsewhere but could have occurred in this area. The Pigeon River watershed is unusual in that it is divided by the Appalachian Mountains. The mountains have prevented major storms from centering over the entire watershed. Since the major portion of the watershed is east of the mountains, it is assumed that critical storms will occur there. The maximum probable flood, as reported in the TVA publication, was calculated using a rainstorm of 11.4 inches in 6 hours and utilizing unit hydrograph techniques with appropriate watershed factors.

From these hydrological calculations,

> "the peak discharge of the Maximum Probable Flood for this stream at the Canton gage was determined to be 81,000 cubic feet per second. The same rate was used at Clyde, downstream, because the reducing effect on the flood wave in travelling from Clyde to Canton would neutralize the additional inflow which enters from the small drainage area between these places. This peak rate of discharge, is about two and one-half times that of the presently known maximum flood of August 30, 1940".

At Landfill Number 6, the high water elevations corresponding to the 81,000 cubic feet per second flow are 2564 at the east end and 2557 at the west end. The maximum probable flood would occur on the average at rather long intervals of time, but the frequency is not susceptible to definite determination. Although larger floods are possible, the combination of factors needed would coincide rarely, if at all.

In the bound Engineering Report, title noted below, are complete detail plans and drawings pertaining to the landfill site.

The data shows site dimensions, original elevations, fill elevations, trenching, filling plans and soil boring information.

REPORT OF GEOTECHNICAL EXPLORATION

AND EVALUATION AND CONCEPTUAL SITE

DEVELOPMENT RECOMMENDATIONS

LANDFILL No. 6

Champion Papers

Canton, North Carolina

LETCo. Job No. CH 4507

LAW ENGINEERING TESTING COMPANY

CHARLOTTE, N.C.

Drawing Under Seperate Cover

OPERATIONAL REPORT

Landfill 6 is to receive solid wastes from Champion International's Mill at Canton, N.C. These wastes, amounting to approximately 1,808 cubic yards each day are comprised of waste treatment sludge (59%) flyash and cinders (17%) and excess lime mud (24%). The following tables display solid waste disposal volumes and analyses.

- Table I, Disposal Volumes
- Table II, Primary and Secondary Sludge/Flyash Combination Subjected to Hazardous Wastes Criteria (RCRA)

Under normal mill operating conditions solid wastes will be hauled to Landfill 6 between the hours of 6:30 a.m. and 9 p.m. daily. It will be a seven-day week operation. Hauling periods will be extended whenever the waste quantity generated at the mill exceeds that which can be hauled during those hours. There are periods, during bark boiler repairs or lime kiln repairs, when it will be necessary to haul around-the-clock. Spread and cover of material hauled at night will be done the following day.

A bulldozer with operator will be at the landfill site during the hours of 6:30 a.m. - 9 p.m. When necessary, this period will be extended to meet spread cover requirements. A front-end loader with 5 cubic yard bucket is available whenever needed.

George Pickard, landfill supervisor, is the individual responsible at the Canton Mill for operation and maintenance of the site.

After closure, the landfill could be used for pasture as well as hay, corn and tobacco crops. The anticipated life time of Landfill 6 projeot is approximately 15 years at current solid waste volumes.

TABLE I

CANTON MILL SOLID WASTE DISPOSAL VOLUMES

1982 AVERAGES

Solid Waste	Average Daily Truckloads	Estimated Cubic Yards Per Truck	Daily Yards
• Waste Treatment Sludge	53	20	1,060
• Lime Mud	23	20	460
• Fly Ash	7	28	196
• Cinders	4	28	112
Total	87		1,828

TABLE II

Primary Sludge and Secondary Sludge/Fly Ash

Combination Subjected to Hazardous Wastes Criteria (RCRA)

- EP TOXICITY (mg/l of the extract)

Contaminant	Primary Sludge	Secondary Sludge/Fly Ash	Federal Maximum Allowable Concentration 100 X Drinking Water Standard
Arsenic (mg/l)	0.005	0.759	5.0
Barium	1.17	0.81	100.00
Cadmium	0.01	0.01	1.0
Chromium	0.22	0.17	5.0
Lead	1.53	0.13	5.0
Mercury	0.001	0.001	0.2
Selenium	0.001	0.001	1.0
Silver	0.001	0.001	5.0
Endrin	0.0003	0	0.02
Lindane	0	0.00005	0.4
Methoxychlor	0	0	10.0
Toxaphene	0	0	0.5
2, 4-D	0.00029	0.0002	10.0
2, 4, 5-TP Silvex	0.00005	0.00003	1.0

- CORROSIVITY - None
- IGNITABILITY - None
- REACTIVITY - None

Note: Neither sludge type contains to the best of our knowledge any of the listed hazardous chemicals.

Flyash is no longer used as a dewatering aid for secondary sludge.

SOIL EROSION AND SEDIMENT CONTROL

PLANS FOR

LANDFILL NO. 6

September, 1981

SOIL EROSION AND SEDIMENT CONTROL MEASURES

Temporary Measures

Mr. Donald Holebrooks, NC Soil Erosion Control, visited the site of the proposed landfill No. 6. His following letter dated August 24, 1981 addresses his recommendations for temporary measures for the landfill construction site.

Permanent Measures

In general the perimeter of the landfill will be graded to prevent surface water from flowing into a compartment and/or ponding behind any of the perimeter containment dikes. Drainage ditches will be maintained to channel runoff and prevent water flow from becoming concentrated on fill slopes to minimize the potential for erosion. The seeding recommendations for the landfill site have been addressed by Mr. Bill Yarborough, District Conservationist, in his enclosed letter.

North Carolina Department of Natural Resources & Community Development
James B. Hunt, Jr., Governor
JOSEPH W. GRIMSLEY, SECRETARY

August 24, 1981

Mr. Larry Griffin
Environmental Control Section
Champion Paper Company
Canton, North Carolina 28716

Re: Champion Landfill #6
Haywood County

Dear Mr. Griffin:

This letter is in response to your request that our office review the proposed construction of Champion Paper's Landfill #6 and the erosion control for this project.

In reviewing the construction drawings and from a site investigation, the following recommendations are made:

1. Treat each of the 7 cells of the landfill as individual sediment basins. Each cell would use a perforated riser surrounded by washed, crushed stone as a filter material. If necessary, the riser pipe should be wrapped in filter fabric to remove fines materials that the stone filter could not catch. The pipe size would be determined by the size of the basin and acreage of the watershed affected. The pipe should be installed as soon as fill material is placed to provide the sediment protection that will be needed.

2. Provide all pipe outlets with a velocity dissipator as needed to reduce erosive water velocities.

3. On the fill sections of cells B, C, and D, construct earthen berms with an inverse slope midway on the fill slope. Water collected by these berms should be channeled to control collection points and removed from the fill slopes. Pipe outlets need to be protected with energy dissipators.

4. Install either silt fence or some other type of erosion control structure below all fill slopes to keep sediment from entering the river or any branches in the area.

5. If possible, limit construction to one cell area at a time. This would reduce the amount of land-disturbing at any one time.

If you have any questions about this matter, please feel free to contact me at this office.

Sincerely,

Donald C. Holebrooks/a

Donald C. Holebrooks
Environmental Engineering Tech

DCH:a

8/25/81

cc: Dave Smiley
George Brown
George Pickard
Sam Calhoun

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
P. O. Box 425, Waynesville, N. C. 28786 February 24, 1982

Larry Griffin, Representative
Champion Papers
Canton, N. C. 28716

Dear Larry,

I enjoyed discussing erosion control on the proposed Champion Landfill "6". I understand that your engineers will be responsible for the water control on the project (both temporary and permanent). We will be glad to furnish the seeding recommendations.

We prepared a conservation plan for Landfill "5C" dated September 12, 1980. We suggested the use of tall fescue and sericea lespedeza on all slopes. Also, all wet areas were planned to be seeded with reed's canary grass. The seeding with these materials provided good results on Landfill "5C".

I suggest the use of these materials again. Follow the recommendations in your conservation plan for Landfill "5C".

I still suggest the planting of white pines or improved Virginia pines on cut slopes in addition to the above recommendations.

If we can be of further service, please call.

Sincerely,

Bill Yarborough

Bill Yarborough
District Conservationist

CHAMPION INTERNATIONAL

CANTON MILL

GROUND WATER AND SURFACE WATER SAMPLING AND ANALYSIS PLAN

Introduction

The proper sampling of ground water and surface water associated with a landfill site is imperative. Management decisions based on the analytical data obtained from the samples are totally dependent upon the validity of the samples taken.

Minimum sampling frequency will be set by the North Carolina Solid Waste Management Branch.

Surface Water

- "Submarine" subsurface grab sampler or bottle held below surface collect sample from below surface in center of main flow of the stream.

Ground Water - Submersible Pump (1)

- The primary consideration in taking ground water samples is to obtain a representative sample of ground water by guarding against mixing the sample with stagnant (standing) water in the well casing.

- Ground water monitoring wells will be installed in locations and according to specifications as provided by the North Carolina Waste Management Branch. See Appendix I.

- For wells that can be pumped empty, the well should be evacuated and allowed to recover before sample withdrawal. If time allows, evacuation of more than one volume* is preferred. After evacuation the sample can be drawn at the pump discharge or with a Kemmerer-type sampler (2). The Kemmerer should be thoroughly clean and rinsed with clean tap water and sample well water at least once before taking a sample from the well.

- For high-yield wells which cannot be evacuated to dryness, the pump should be placed just below the surface of the water and at least 3 volumes* of water pumped at the well's recovery rate. The pump should then be lowered to near the screen bottom and at least one volume* pumped at the well's recovery rate. The sample can then be drawn at the pump outlet. It is assumed the pump system is completely flushed out by this time. If there is concern that contamination from the pump may still be a problem, the pump may be removed from the well and the sample drawn with a Kemmerer-type sampler (2) as described above.

*Well volume based on the diameter and water depth in the well casing.

Preservation

Without proper preservation of samples, sample character can change between the time of sampling and time of analysis. This may be due to biological or chemical action. Preservation methods are generally limited to pH control, chemical addition, refrigeration, and freezing. Samples should be preserved according to Table 14 (3) of EPA Manual SW-611 (SW-616) attached to this plan, Appendix II. Many consulting laboratories provide styrofoam shipping containers with prepared sample containers including necessary preservatives for various analyses. Samples should be placed in bottles containing preservatives on site. All samples needing refrigeration should be chilled on site and kept cold. All samples needing refrigeration should be packed and shipped with "blue ice" cold packs or dry ice to maintain lowered temperatures (approximately 4° C.) until analysis. Samples may be frozen as long as an air space is left in the sample container to prevent the ice from splitting or breaking the container.

Transportation (See Appendix III)

The mode of shipment used to transport water samples to an outside consulting laboratory should be selected by taking the following factors into consideration:

- What is the safe holding time for the parameters to be tested?
- Do the samples have to be kept cold as a means of preservation?
- What is the location of the outside consulting laboratory?
- What is the fastest way to get the samples to the consulting laboratory?

If preserved sample hold time is 7 days or less, samples must be kept cold. If analysis results are needed as soon as possible, samples should be shipped to arrive the next day at the receiving laboratory. When this is the case, the following is suggested:

- Get the shipping order approved and through Purchasing Department ahead of time. This will eliminate having to "walk it through" on sampling day.
- Samples should be collected and shipped early in the week so they will arrive at the receiving laboratory well before the weekend.
- Call the receiving laboratory and give them the mode of shipment, shipment number, Champion purchase order number, when it should arrive, and if necessary, what analyses you are requesting.
- Samples must be packed in appropriate shipping container with proper labeling.

The location of the consulting lab will determine the mode of shipment as well. Various modes of shipment may include air freight, UPS, Express Mail,

bus, company truck or car, etc. One-day delivery to a laboratory in Asheville might best be done by company car. UPS has one-day service to Greenville, South Carolina. However, it would require Express Mail or air freight for one-day delivery to Pittsburgh, Pennsylvania. Reliability of the carrier is also a consideration.

Shipping containers with labeled sample bottles already containing preservatives are supplied by most outside consulting laboratories. A supply of styrofoam shipping containers in various sizes should also be kept on hand. These are available from most scientific supply houses.

If preserved samples do not require refrigeration and can be held for an extended time, they may be shipped UPS. For example estimated delivery time from Asheville, North Carolina to Pittsburgh, Pennsylvania via UPS is three working days.

Analysis

Analyses should be performed according to EPA acceptable procedures by a certified laboratory. In most states EPA does not certify a water analysis laboratory. The State environmental division does the certifying. North Carolina has a laboratory certification system. The best possible arrangement is to have surface and ground water analyses run by an outside consulting laboratory which has received certification by the State of North Carolina or equivalent. The current laboratory contracted to do these analyses is listed in the Appendix.

Recordkeeping (4)

Adequate records should be maintained for each sample that is taken. The "Ground Water and Surface Water Monitoring Log Book" has a description of its organization included at the front of the book as follows:

Date:	(Month - Day - Year)	
Sampler:	(Name of Person Taking the Sample)	
Sample:	(ID Number (consecutive, will double as page number, one page per sample site, bottles and samples labeled 101a, 101b, 101c, etc.)	
	Type	(groundwater or surface water)
	Source	(Champion well identification, stream name, etc.)
	Time	(time of day sample taken)
	Preservation	(HNO_3, H_2SO_4, Cold, etc. Note which sample was preserved with what, i.e., "101a - HNO_3, 101b - Cold", etc.)
	Method	(method of sampling, i.e, "pump outlet" or Kemmerer")
	Purpose	(annual check, coincide with State, complaint, etc.)
	Container Type	(glass, PE, PP, TfE, screwcap, stopper, etc.)

Field Analyses

pH, Temperature, DO, Special Cond.	(whatever must be run onsite at the time of sampling, extra space is provided for any additional tests)

Comments

Weather	(significant weather information, i.e., "sunny, warm, no rain for 5 days", etc.)
Receiving Lab	(whoever will be doing the lab analyses, i.e, NUS, Hamilton, Blount, Canton Mill, etc.)

How the sample is transported to the receiving lab should also be recorded.

The log book is intended to serve as a record of ground water and surface water sampling of monitoring wells and streams associated with Champion landfill sites for the Canton Mill operation as well as domestic wells and runoff related to the operation.

Analytical results should be recorded in the Landfill Data Summary and a report circulated to management as soon as the results are available.

Chain-of-Custody

In the event of serious problems and/or potential enforcement action, pages 228-231 of EPA Manual SW-611 (SW-616) (5) should be followed as strictly as possible. However, for routine sampling, the first nine items on the "Ground Water and Surface Water Monitoring Log Book" rubber stamp can serve as a routine chain-of-custody format. A tag should be attached to each sample bottle with the following information:

Date	(Month - Day - Year)
Sampler	(Name of person taking the sample, and signature)

Sample

ID Number	(Same as in Log Book)
Type	(Ground Water or Surface Water)
Source	(Champion well number, stream name, etc.)
Time	(Time of day sample taken)
Preservation	(HNO_3, H_2SO_4, Cold, etc.)
Method	(Method of sampling, i.e., "pump outlet" or Kemmerer")
Purpose	(Annual or quarterly check, coincide with State, etc.)

The analyst(s) who does the analyses at the receiving lab should also sign the tag and the tag returned with the analytical results.

REFERENCE

Procedures Manual for Ground Water Monitoring at Solid Waste Disposal Facilities, EPA/530/SW-611, August 1977 (SW-616):

(1) Ibid. Pages 221, 227

(2) Ibid. Page 223

(3) Ibid. Pages 232-237

(4) Ibid. Pages 228-229

(5) Ibid. Pages 228-231

APPENDIX I

PROCEDURES FOR INSTALLATION OF GROUND-WATER MONITORING WELLS

The location of monitoring wells at the proposed landfill site is the most critical phase of the site development. Placement of the monitoring wells will be based on ground-water gradients established during the preliminary site investigation. The selection of monitoring well locations must be coordinated with the geologist for the Solid and Hazardous Waste Management Branch. This is to assure uniformity of installation procedures and conformance with EPA regulations.

The procedure for drilling through the unsaturated soil mantle to the water bearing formation is a standard procedure with most consulting and well drilling firms. The only precaution in this state of the installation is minimizing the use of drilling fluid (bentonite-gel mixture), flocculants (mixtures of sodium pyrophosphate) and excessive use of lubricants. If any of these or relating products are used in the drilling process, the hole should be flushed to remove as much of the contaminants as possible.

Installation of the monitoring well and placement of the well screen is critical to assure the gound-water sample represents the uppermost layer of the water-bearing material where hydrocarbons and toxic organics may accumulate. A minimum well screen length of ten feet is required. In most cases an additional five-foot section of well screen above the ground-water level at the time of boring will be required. This is to account for a possible rise in the static ground-water level due to stabilization after boring and seasonal fluctuations.

In connecting sections of PVC pipe, clamps or threaded fittings of pipe is preferred over epoxy cement as the latter may contaminate ground-water samples.

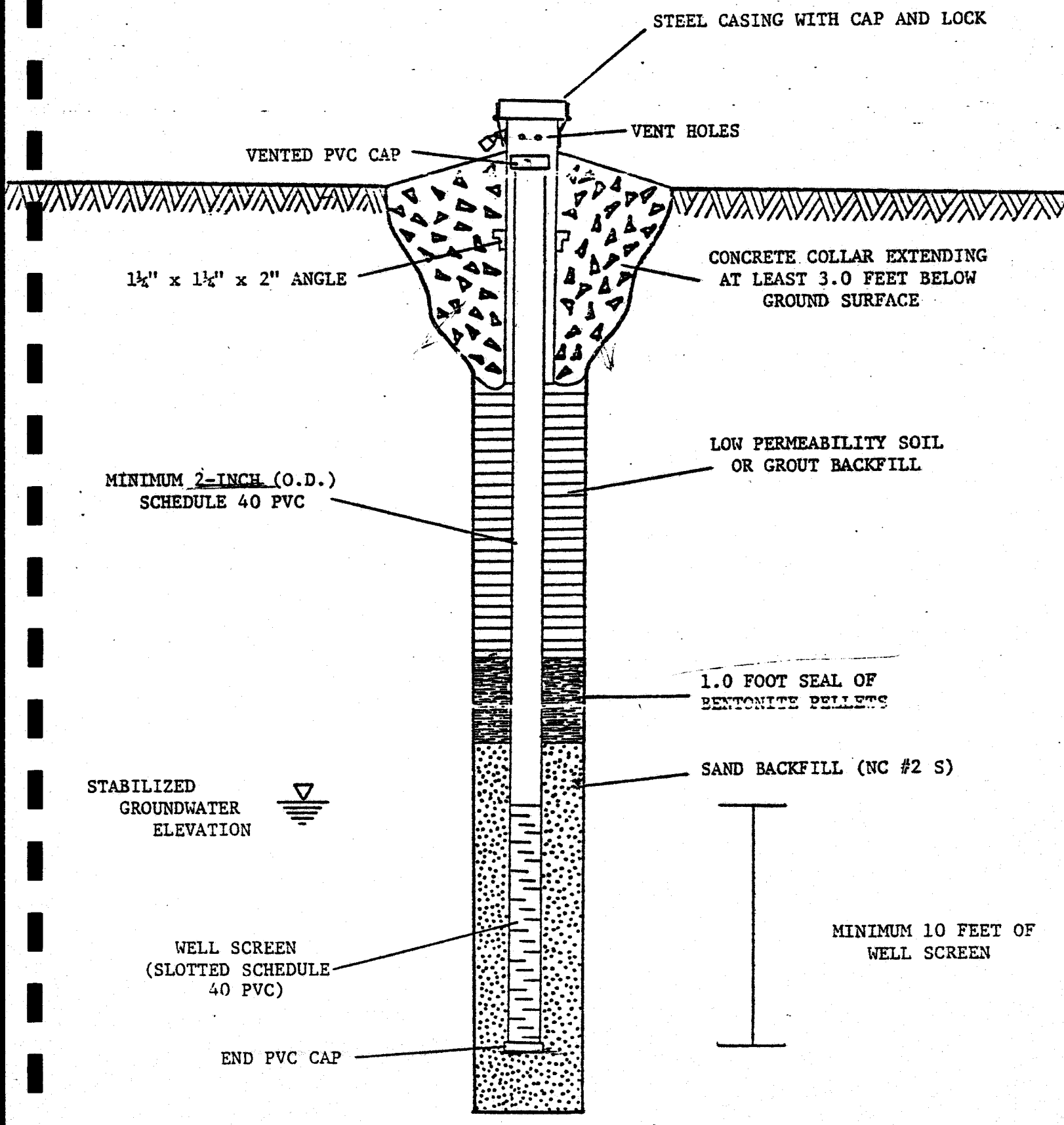
Sand, used as a pre-screening of influent ground-water, should be washed to remove all fines and prevent clogging of the well screen.

The remainder of materials used in the installation of the monitoring wells are fairly self-explanatory. Should questions arise as to the type of materials or any phase of the installation, please contact the geologist for the Solid and Hazardous Waste Management Branch in Raleigh, North Carolina, at (919) 733-2178.

FIGURE I

TYPICAL GROUNDWATER MONITORING WELL INSTALLATION

SOLID & HAZARDOUS WASTE MANAGEMENT BRANCH
DIVISION OF HEALTH SERVICES



Rev. 8/81

APPENDIX II

TABLE 14

RECOMMENDATION FOR SAMPLING AND PRESERVATION OF SAMPLES ACCORDING TO MEASUREMENT[1]

Measurement	Vol. Req. (ml)	Container	Preservative	Holding Time (6)
Acidity	100	P,G(2)	Cool, 4°C	24 Hrs.
Alkalinity	100	P,G	Cool, 4°C	24 Hrs.
Arsenic	100	P,G	HNO_3 to pH<2	6 Mos.
BOD	1,000	P,G	Cool, 4°C	6 Hrs.(3)
Bromide	100	P,G	Cool, 4°C	24 Hrs.
COD	50	P,G	H_2SO_4 to pH<2	7 Days
Chloride	50	P,G	None Req.	7 Days
Chlorine Req.	50	P,G	Cool, 4°C	24 Hrs.
Color	50	P,G	Cool, 4°C	24 Hrs.
Cyanides	500	P,G	Cool, 4°C NaOH to pH 12	24 Hrs.
Dissolved Oxygen				
Probe	300	G, only	Det. on site	None
Winkler	300	G, only	Fix. on site	None
Fluoride	300	P,G	Cool, 4°C	7 Days
Hardness	100	P,G	Cool, 4°C	7 Days
Iodide	100	P,G	Cool, 4°C	24 Hrs.
MBAS	250	P,G	Cool, 4°C	24 Hrs.
Metals				
Dissolved	200	P,G	Filter on site HNO_3 to pH<2	6 Mos.
Suspended			Filter on site	6 Mos.
Total	100		HNO_3 to pH<2	6 Mos.

TABLE 14 (continued)

Measurement	Vol Req. (ml)	Container	Preservative	Holding Time (6)
NTA	50	P,G	Cool, 4°C	24 Hrs.
Oil & Grease	1,000	G only	Cool, 4°C H_2SO_4 to pH<2	24 Hrs.
Organic Carbon	25	P,G	Cool, 4°C H_2SO_4 to pH<2	24 Hrs.
pH	25	P,G	Cool, 4°C Det. on site	6 Hrs. (3)
Phenolics	500	G only	Cool, 4°C H_3PO_4 to pH<4 1.0 g $CuSO_4$/l-	24 Hrs.
Phosphorus				
Ortho-phosphate, Dissolved	50	P,G	Filter on site Cool, 4°C	24 Hrs. (4)
Hydrolyzable	50	P,G	Cool, 4°C H_2SO_4 to pH<2	24 Hrs. (4)
Total	50	P,G	Cool, 4°C	24 Hrs. (4)
Total, Dissolved	50	P,G	Filter on site Cool, 4°C	24 Hrs. (4)
Residue				
Filterable	100	P,G	Cool, 4°C	7 Days
Non-filterable	100	P,G	Cool, 4°C	7 Days
Total	100	P,G	Cool, 4°C	7 Days
Volatile	100	P,G	Cool, 4°C	7 Days
Setteable Matter	1,000	P,G,	None Req.	24 Hrs.
Selenium	50	P,G	HNO_3 to pH<2	6 Mos.

TABLE 14 (continued)

Measurement	Vol. Req. (ml)	Container	Preservative	Holding Time (6)
Mercury				
Dissolved	100	P,G	Filter HNO_3 to pH<2	38 Days (Glass) 13 Days (Hard Plastic)
Total	100	P,G	HNO_3 to pH<2	38 Days (Glass) 13 Days (Hard Plastic)
Nitrogen				
Ammonia	400	P,G	Cool, 4°C H_2SO_4 to pH<2	24 Hrs.(4)
Kjeldahl	500	P,G	Cool, 4°C H_2SO_4 to pH<2	24 Hrs.(4)
Nitrate	100	P,G	Cool, 4°C H_2SO_4 to pH<2	24 Hrs.(4)
Nitrite	50	P,G	Cool, 4°C	24 Hrs.(4)

TABLE 14 (continued)

Measurement	Vol Req. (ml)	Container	Preservative	Holding Time (6)
Silica	50	P only	Cool, 4°C	7 Days
Specific Conductance	100	P,G	Cool, 4°C	24 Hrs.(5)
Sulfate	50	P,G	Cool, 4°C	7 Days
Sulfide	50	P,G	2 ml zinc acetate	24 Hrs.
Sulfite	50	P,G	Cool, 4°C	24 Hrs.
Temperature	1,000	P,G	Det. on site	None
Threshold odor	200	G only	Cool, 4°C	24 Hrs.
Turbidity	100	P,G	Cool, 4°C	7 Days

1. More specific instructions for preservation and sampling are found with each procedure as detailed in this manual. A general discussion on sampling water and industrial wastewater may be found in ASTM, Part 23, p. 72-91 (1973).

2. Plastic or Glass

3. If samples cannot be returned to the laboratory in less than 6 hours and holding time exceeds this limit, the final reported data should indicate the actual holding time.

4. Mercuric chloride may be used as an alternate preservative at a concentration of 40 mg/l, especially if a longer holding time is required. However, the use of mercuric chloride is discouraged whenever possible.

5. If the sample is stabilized by cooling, it should be warmed to 25°C for reading or temperature correction made and results reported at 25°C.

6. It has been shown that samples properly preserved may be held for extended periods beyond the recommended holding time.

APPENDIX III

PACKAGING AND TRANSPORTATION TO BLOUNT LABORATORY, JULY, 1982

(1) Use bottles and shipping containers supplied by Blount.

(2) Initiate the request for shipping order a week in advance of sampling to facilitate shipment of the samples.

(3) Samples may be shipped via UPS to the following address:

Blount International Ltd.
Building 105, Club Drive
Donaldson Center
Greenville, North Carolina 29607

Attention: Mr. Lee Kent

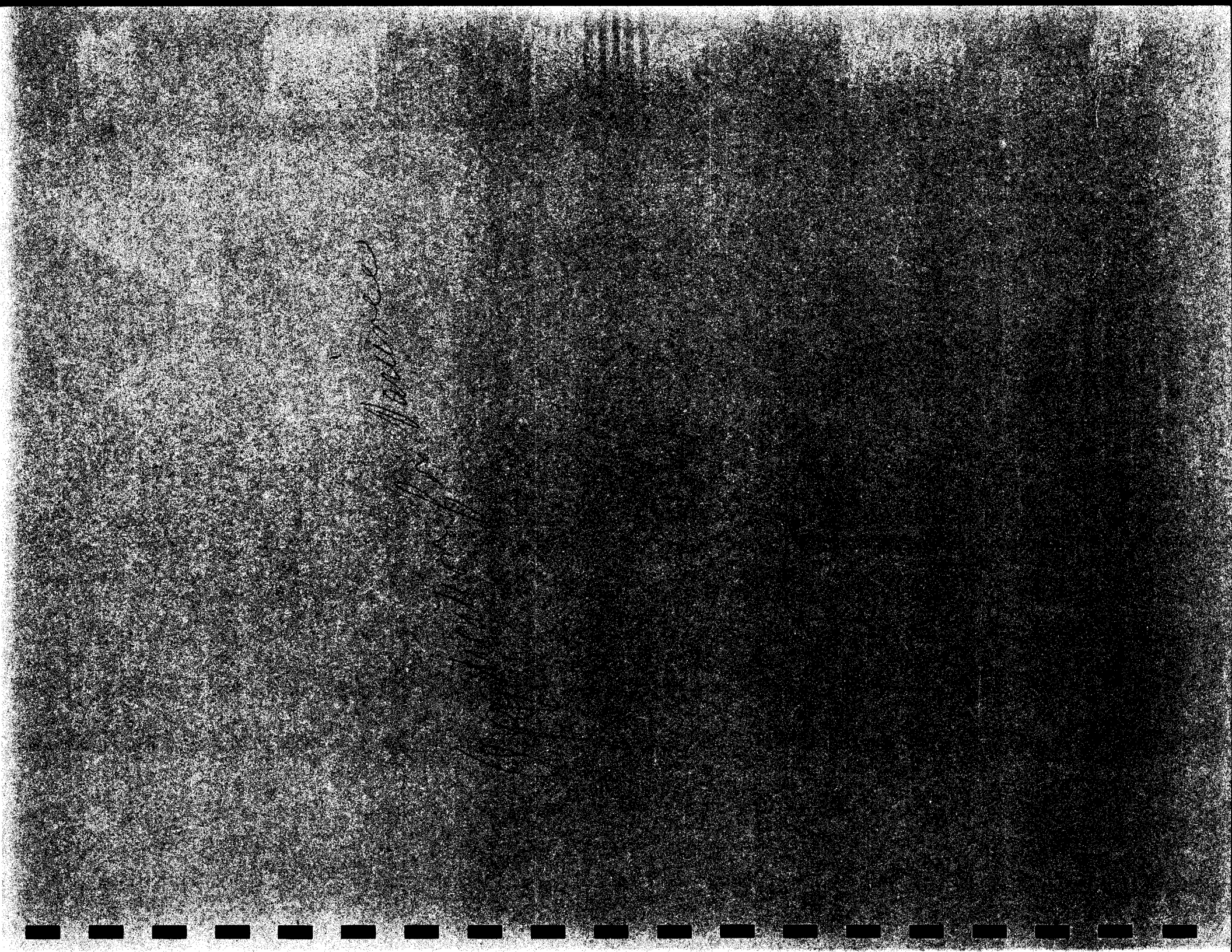
(4) Notify Mr. Lee Kent, (803) 277-7950, at Blount the samples are coming and give the Champion Purchase Order number, the shipping order number, and the UPS Bill of Laden number the analyses are to be handled under (P.O. No. 94536 is in effect until July 31, 1983).

(5) Mailing label should include, "Attention: Mr. Lee Kent".

(6) Samples should be taken and shipped early in the week to avoid potential weekend delays.

(7) Sample bottles should be frozen at an angle and packed in absorbent material (paper toweling) with "Blue Ice" or dry ice.

(8) This appendix should be updated as needed in the event of a change in consulting labs or shipping procedures.



APPLICATION FOR VARIANCE

SANITARY LANDFILL - SITE SIX

The SOLID WASTE MANAGEMENT RULES, Subchapter 10C-Solid and Hazardous Waste Management Branch, SECTION .0117 VARIANCES, provides for the Division of Health Services to grant variance from prescribed operational requirements outlined in Section .0117 (a).

The proposed Sanitary Landfill - Site 6 will be used for disposal of industrial wastes from Champion Papers Canton Mill. The wastes consist of waste treatment primary and secondary sludge, fly ash, cinders, excess lime sludge and bark.

Approximately 59% of Champion Papers' wastes are waste treatment sludges. The remaining wastes are comprised mostly of fly ash, cinders, lime sludge and bark. Frequently they are used as cover materials, especially the fly ash, cinders and bark. Spread and cover of wastes are done on a daily basis with the above mentioned materials.

Champion Papers requests the DIVISION OF HEALTH SERVICES consider granting a variance from compacted daily cover of its wastes. We request to use the materials noted in above paragraph for cover of landfill wastes. The materials have been used satisfactorily in the past at other landfills operated by the company.