2.2 RAW MATERIALS AND TYPES OF PRODUCTS

Up until 1890, the primary raw material used at the Vacuum Oil Works was crude oil, which was used in the preparation of finished lubricant products. Vacuum Oil began receiving crude oil in wooden barrels from the Bradford Field located in Pennsylvania in 1869. It was estimated in 1887 that Vacuum Oil used over 4 million gallons of crude oil per year (Wagner, 1990).

With the purchase of the Olean Works in Olean, New York in 1890, the Rochester Works facility no longer needed to accept crude oil. Instead it began accepting raw lubricant stocks from the Olean Works for conversion into salable products. Olean at that time was a delivery point for the main pipelines coming north from the oil fields in Bradford, Pennsylvania. The purchase of the Olean Works from the Eclipse Lubricating Oil Company did away with the necessity to transport crude oil stock to the Rochester Works. Naphtha, refined oil, fuel oil and other products (considered to be by-products of the distillation process used at the Rochester Works) were then handled solely at the Olean Works. Raw lubricating stocks were sent to Rochester by rail car for finishing, barreling, canning, and shipping (Rochester Democrat & Chronicle, 1916).

In the first years of operations, Vacuum Oil made kerosene as the primary distillate. The residual oil was used in finishing leather, and, after the addition of lamp black, was used in refinishing harness boots and other black leather goods (Wagner, 1990). However, the primary interest of Hiram Everest, the co-founder of Vacuum Oil, was in the residual oil produced in the vacuum distillation process. So, in the 1870's, lubricating oils for machinery use began to be generated as the primary product. The production of cylinder lubricating oils followed soon after. Hiram Everest patented the lubricating oils produced through the Vacuum Oil process under the name Gargoyle 600-W (Barnes, 1981). Lubricating oils were sold under the trade name Gargoyle throughout the life of the Rochester Works.

Paraffin was introduced as a product in 1884. In 1888, a line of neutral oils was introduced, and in 1889, spindle oils were introduced for use at cotton spinning mills. In the 1880's, naphtha was sold as a product. It was estimated that over the last half of 1886 and the first half of 1887, that

(to the right) of the building marked "Canning Bldg". A small building marked as an acid house is still located between the line of oil tanks and the Grease Manufacturing Building in the Former Storage/Operations Area of the Site (see Figure 2-9 and Figure 2-14).

2.4 WASTE MATERIALS AND DISPOSAL AREAS

There is little information that can be presented regarding the specifics of waste products produced through the formulation of lubricants at the Vacuum Oil facility, other than the formation of kerosene and naphtha, which while the original goal of Vacuum Oil, was in actuality a by-product of the vacuum distillation process. A summary of the potential waste materials generated at the refinery is as follows:

1. The vacuum distillation process would result in the generation of very heavy residues such as waxes and asphalts for which there was no use at the time;
2. Tank bottoms; very possible that when these materials rose to sufficient levels in storage tanks that the ability to move stored oil through piping was impaired, that the bottoms were cleaned;
3. Solids from settling tanks;
4. Solids from cooling tanks;
5. Wastes from furnaces and the fire boxes from the stills (coke, ash, and cinders);
6. Soaps and additives that might have been used in the manufacturing process of the greases and lubricants;
7. Spills and leaks associated with transfer of oil, gasoline, and product within the plants or off-loaded from rail cars;
8. Residuals from coal pile;
9. Spent filter cake;
10. Laboratory wastes;
11. Machine shop oils and wastes; and
12. Garbage and household debris.

In comparison to other petroleum refining operations the production of oil and grease is not a particularly dirty operation.

There is no information regarding onsite disposal areas and practices. Wagner (1990) notes reports of a burning pit being present somewhere onsite. The pit was closed in 1887 due to complaints about odors and smoke.

2.5 PIPELINES

The following information is taken from Wagner (1990). He notes that there are scattered and vague reports of pipelines that ran from the Vacuum Oil Works to various locations in the City of Rochester. From the information available, he indicates that there were at least three pipelines that did exist at one time. A three-inch line ran from the Vacuum Oil Works location at Mansion Street, along the Erie Railroad, and connected to three tanks located at the Vacuum Oil operations located on Glasgow Street. A second pipeline, two inches in diameter, ran along the same course to Glasgow Street, then ran through Glasgow Street to the old Genesee Valley Canal, and then on to the Central Hudson Railroad near Litchfield Street. A third pipeline ran from the Municipal Gas Works through Frank Street. Figure 2-19 shows the approximate layout of these pipelines.

2.6 SEWERS

The following information is taken from Wagner (1990). Until 1887, Vacuum Oil discharged their wastes to the Rochester city sewers. After that time, Vacuum Oil installed a complete system of drains and sumps of their own to handle surface water and groundwater on their property, and the adjoining Pennsylvania railroad property. Figure 2-20 shows the approximate location of the sewer lines based on the 1892 Sanborn Map.

The Vacuum Oil system included an eight-inch tile drain that was four feet deep and located one hundred feet west of the Pennsylvania Railroad. This drain ran from the south line of the oil

company's property, north to a pump sump near the north part of their property. From the north side of this property was a drain behind a retaining wall that ran south of this pump sump.

Under the west ditch of the Pennsylvania Railroad was a ten-inch drain on rock, which flowed into a large sump between the Pennsylvania Railroad tracks. All of the track drainage was taken to this sump by drainage ditches. All of the buildings between the river and the Pennsylvania Railroad tracks also drained to the sump. From this sump, drainage was pumped to a main sump just to the west. Here most of the oil was recovered by a series of baffle sumps, after which it flowed to a sump east of the railroad and then to the Genesee River.

In addition to these sumps and sewers, there was a 24-inch discharge pipe that ran through a retaining wall on the east side of the property, and an 8-inch iron intake pipe that extended from an intake changer through an opening in the retaining wall about 100 feet south of an old 36-inch city water main. Vacuum Oil drew water from the river and had constructed a valve chamber on the back of the retaining wall at the point where the intake was located.

2.7 SHIPMENT AND MODES OF TRANSPORTATION

Vacuum Oil (Undated) reports that oil was received from regional oil fields in wooden barrels. These barrels were generally about 42 gallons in size. The earliest tank cars used to transport crude oil were simply flat cars with two cisterns located on them. Vacuum Oil eventually built six tank cars for transportation, each of which carried about 80 barrels of oil.

In the 1860's, kerosene was shipped from the Rochester Works in second hand wooden barrels that were obtained from wherever possible and were cleaned and coopered onsite. Lubricating oils were shipped from the works in tin cans. The first tin cans were recycled following use for shipping food to a local restaurant. Subsequently, a local manufacturer made tin cans for Vacuum Oil. Eventually, the company produced its own wooden barrels and tin cans. In the 1870's, kerosene was shipped from the works in tanks cars that had been used to receive crude oil. During that time period, the cars were cleaned with naphtha after the crude oil had been

addition, soil samples were also analyzed for VOCs, SVOCs, and /or metals. No soil samples were collected from test pits TP-6, TP-7, TP-9, and boring MW-3 since there were no indications of impacted soils during the site investigation.

3. Five surface soil samples were collected and analyzed for TAL metals, cyanide, TCL VOCs, TCL SVOCs, TCL pesticides and PCBs.

4. Three groundwater samples were collected from on-site monitoring wells and analyzed for VOCs, SVOCs, metals, and TPH.

Figure 4-1 shows the location of the samples collected by the NYSDEC as part of this investigation.

As stated in the report, results from this investigation indicated petroleum-related contamination with respect primarily to SVOC and BTEX parameters in the surface soil, subsurface soil and groundwater on-site. The most significant petroleum contamination was detected in the northern portion of the site. The report also indicates that to a lesser extent, chlorinated VOCs, metals, and pesticides were also detected above New York State standards.

According to the Passive Soil Gas Survey Results and Contour Map: TPH (shown as Figure 4-2), two areas of concern are located at the northern portion of the Site in that area identified as the Former Barrel Prep and Storage Area and mid-section of the 24-acre Site (east of Riverview Place, centered on the southern end of the Former Canal Rail Line Area). It is noted that the soil gas survey results were difficult to adequately evaluate, as the concentrations were difficult to convert because of issues with units.

TPH concentrations ranged from 250 to 14,800 nanograms and 175 to 53,000 nanograms at these two areas, respectively Although Figure 4-2 illustrates that the TPH isopleths depicting a concentration of 250 nanograms exists across the junkyard, this reported concentration was extrapolated, as the area currently occupied by the junkyard was not included in the soil gas

Operations

In 1866 Vacuum Oil began their operations with a semi-commercial still on Mansion Street (currently Exchange) and continued there until 1936. These operations entailed distilling crude petroleum under pressure to produce lubricating oils, naphtha, and kerosene. Figure 1 shows this area of operations.

The improvements in the distillation process for which Ewing and Everest received a patent consisted of "introducing jets of superheated steam into and through the mixture of oil in the still and having the arrangement of the heated pipe in close proximity so as to lessen the amount of oil in the retort." Figure 2 shows a typical Vacuum Oil still.

During the first years of Vacuum Oil the distillates from this process were sold as kerosene, which was put in second hand barrels for distribution. The residual oil, sweet and unburned, was introduced to tanners for use in finishing leather or, after adding lamp black, was sold for refinishing harness boots and other black leather goods. These leather oils were put in oyster cans. As output increased Vacuum turned temporarily to a local manufacturer for its barrels and cans until it ultimately established its own manufacturing plant to meet its needs.

The first business to make extensive use of Vacuum's leather oils, Alling Brothers Tanners on Andrews Street, became the location of a Vacuum Oil office in 1867.

In 1869 Vacuum Oil began receiving crude oil in wood barrels from the Bradford field. As operations continued the company built and used six tank cars for this purpose, each of which held 80 barrels. In 1878 the company laid tracks on a tressel so that such tank cars from the Erie railroad could be brought into Vacuum Oil's buildings, emptied of crude oil, and filled with Vacuum Oil products.

A coroner's inquest on this date mentions 5 pumps which connected to various tanks in Vacuum Oil's Works. It also references pipes connected to these pumps. A three inch pipe ran along the Erie Railroad tracks to three tanks which held refined oil at Glasgow Street. This pipe was said to have been in a leaky condition for 2 years. Another pipe from the Municipal Gas Works ran through Frank Street. The third pipe crossed the canal and had been broken by a passing canal boat. The pipe ran under the Erie tracks to the river.

The article also mentions a pit used to burn refuse. Located near the works, this pit was abandoned when neighbors complained about the smoke. The exact location of this pit is not given.

One witness testified to seeing 30 barrels of naphtha in the canal in 1879.

12/30/1887

The Coroner's Inquest continued with C. Everest's testimony. He states that Vacuum Oil used 4 million gallons of crude oil per year that was shipped to the works via the WNY&PRR. He mentioned two pipes, one from the works on Mansion Street (currently Exchange) to Glasgow Street, and one through Glasgow Street to the old Genesee Valley Canal, and then to the New York Central and Hudson Railroad near Litchfield Street. Vacuum Oil pumped refined oil to the New York Central and Hudson, and to the Buffalo, Rochester & Pittsburgh railroads.

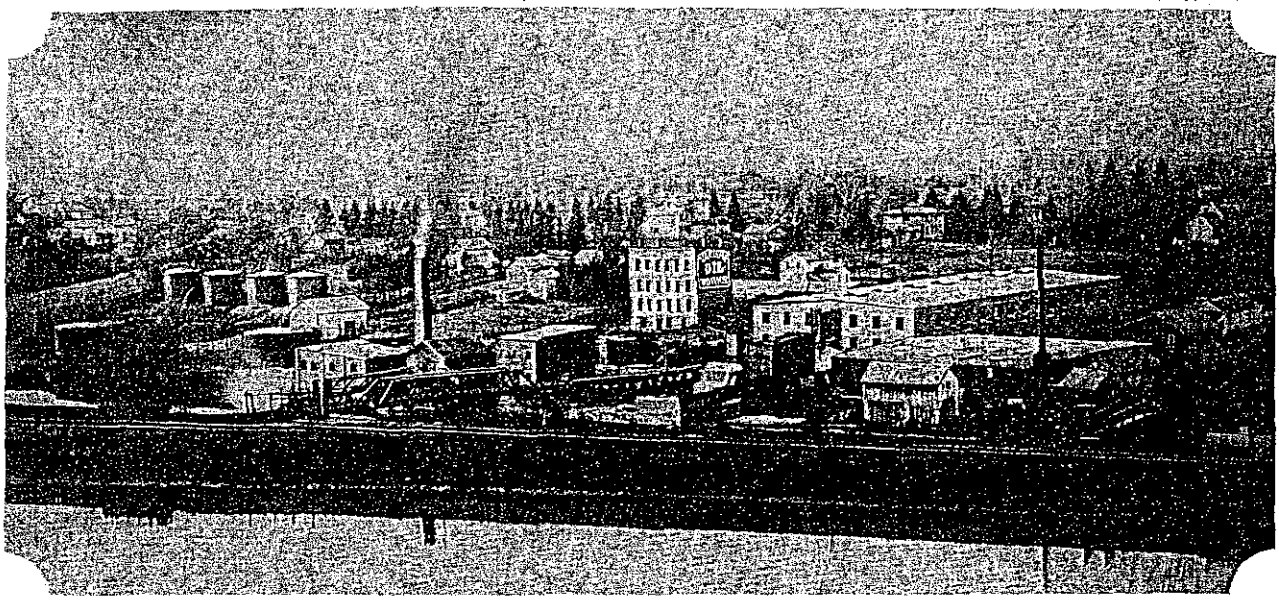
Everest cited the date of construction of the pipe to the Gas Works as 1881 and said that the pipe originated from the pump house on the East side of the Oil Works.

Everest also gave information regarding production. During a period encompassing the last half of 1886 and the first half of 1887, Vacuum Oil produced over 500,000 gallons of naphtha. Over 300,000 gallons of this was pumped to the Gas Works during the same period.

1876-77 Stills 4 and 5 each of about two hundred barrels capacity were built for running an intermediate grade of oils. Apparently the question arose at that time as it did again in 1890 of always having at hand a sufficient amount of crude oil of conditioned quality to keep the still running to capacity because in 1877 storage tanks 1, 2, 3, and 4 each of about five hundred barrels capacity were erected for that purpose.

1878 - The company moved into still larger offices in the Rochester Savings Bank Building. During this year a stone warehouse 200' x 100' was built at the Works. The basement floor was level with the yard and the other floor was conveniently higher so that filled barrels could be rolled on the same level from the building across the platform directly onto trucks backed up in front. The Genesee Valley Canal, which separated the Works into two parts, was bridged and a trestle was built from the canal half way through the building and on the trestle and bridge tracks were laid over which cars from the Erie Railroad were shoved into the building for loading of shipments of oil.

1879 - Mr. H. B. Everest was still listed as secretary with offices in the Rochester Savings Bank Building, his house at Denver, Colorado and Mr. C. M. Everest as wholesale dealer in Refined Petroleum with warehouse at Glasgow Street on the Erie Railway. Cylinder oils



The Rochester Works in 1879

When Vacuum was young—

The Company's works in 1879

By Dr. F. R. BAXTER

We are greatly indebted to Dr. Baxter for this careful and very complete description of this old photograph. While the "Old Timers" will find much of interest in the picture and article, they should be especially inspiring to the younger generation as they compare the company of today with the company of yesterday.—Editor.

THE old photograph of the Vacuum Oil Works, reproduced on this page, fairly represents the condition of the works when I was employed in May, 1881. The date of Autumn, 1879, was supplied me by Mr. J. C. Lighthouse who owned the tannery shown in the right-hand foreground. The photograph was taken from a tower on the estate of Mr. Ellwanger of the old nursery firm of Ellwanger & Barry on the opposite side of the river.

The property of the Vacuum Oil Company began at the brick wall about in the middle of the picture immediately below the brick building bearing the sign—"Vacuum Oil Works," and extended along the side of the large stone building to Exchange Street, which was known at that time as Mansion Street. The iron stack on the tannery had been replaced with a brick one when I arrived, which was the feature that fixed the date of the picture.

The railroad in the foreground is a branch of the Erie, and it was over this line that the supplies of crude oil and barrels were received. The rack car* at the left of the picture contained empty barrels. Just to the right is the rack supporting the pipes through which the crude oil received in tank cars was unloaded into the receiving tanks on the other side of the canal, the waters of which show up at the right of the picture. This was the Genessee Valley canal which was afterward abandoned, the property finally coming into the possession of the Pennsylvania Railroad Company. The branch of the Pennsylvania from here meets the main line of the Erie at Olean, and is the line over which our refinery products have been received from Olean since the construction of the first of our refineries at that point.

The brick building with flat roof at the left of the brick smoke-stack contained the Vacuum stills Nos. 2 and 3. Still No. 1 was in the lower building just behind the peaked roof building. Just along the brick wall referred to is the first fire reducing still which is connected to the squatty square brick chimney just beyond it. The flat top building next to it was the tail house where the cuts of naphtha, steam still stock kerosene distillate, etc., were made. The only source of light in those days was from kerosene lamps, which of course could not be brought near such a dangerous place. The illumination of this building was from a locomotive headlight stationed at the left of the barn which is the peaked building at the left of the brick stack.

At the time this picture was taken, the naphtha and kerosene distillates were sold and shipped in tank cars. The wax distillate was stored in the large tank just below the barn because no use had been found for it up to that time.

The residual oils were finished in the compounding department which was in the left-hand side of

* Not very distinct in the photo.

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the large stone building extending from two or three squares of the end facing you to the extreme opposite end of the building. The compounded oils were filled in the basement of this building, and were then raised to the ground floor and either rolled to the front platform for hauling to the New York Central Railroad or loaded directly into cars on the Erie which were drawn in over the bridge and trestle in the foreground.

The harness oil was made in the peaked roof building next to the smoke-stack, and was then pumped to another section of the stone building where it was put into cans. These cans were made on the third and fourth stories of the building bearing the name "Vacuum Oil Works."

The works' office was in the left-hand corner of the large building, and occupied one square. The filtering department was in the right-hand corner of this building facing this way, and extended up the building about half-way.

The filters were sections of cast iron pipe, some 14-in. some 18-in. inside diameter, and 6 ft. and 8 ft. long. They were suspended from the ground floor and were charged by removing the covers and pouring the boneblack from bags directly into the filters.

After the boneblack had been used once, the oil was allowed to drain, the lower head taken off the filter, and the oil-soaked black carted out into the yard, a large pile showing immediately below the sloping roof this side of the brick building bearing the sign. At that time this black was sold to a fertilizer manufacturer who removed some portion of the oil and converted the balance of it into fertilizer with the use of sulfuric acid.

The dwelling just at the right of the brick building was the home, for several years after the plant started, of Mr. Horace Everest, brother of Mr. Hiram B. Everest, and later housed in succession the head cooper, one of our compounders, the carpenter shop, the leather grease experimental shop, under the direction of Mr. S. Y. Alling, and lastly the laboratory.

The low building just this side the dwelling was the cooper shop. The basement of the brick building was the pipe shop, and the ground floor the printing office, in which the advertising matter for selling Vacuum harness oil was printed. Within the past few years the upper stories were dismantled and the lower floor is now used for the hospital.

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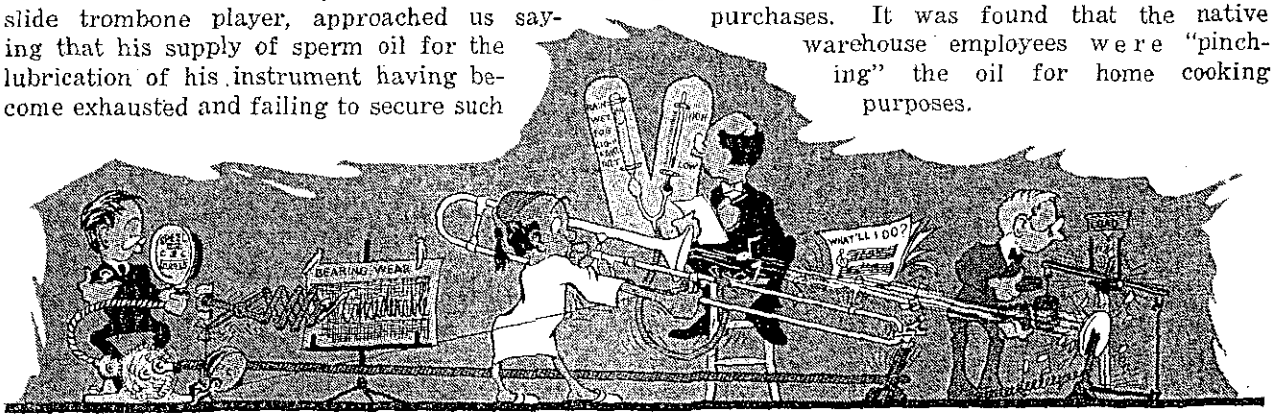
"A grade for each type of service"

EVERY Gargoyle worker knows that the Vacuum Oil Company stands for "the right oil for the right place," or, in other words "a grade for each type of service." That is the idea which is behind the various Charts of Recommendations, the Engine Builders' book, the Lubrication audits, etc.

In Cairo not long ago, this idea was carried out in providing a means for the proper lubrication of a trombone which functioned in a jazz band.

"The leader of the local jazz band who is also the slide trombone player, approached us saying that his supply of sperm oil for the lubrication of his instrument having become exhausted and failing to secure such supplies in Cairo, he requested advice as to the slide tubes of his instrument," says a letter from Cairo.

"Careful analysis of the bearing conditions show the factors of moderate speed, low temperature, wet steam, variable load and considerable bearing wear. You will be interested to know that Gargoyle D. T. E. Heavy Medium is rendering admirable service under these conditions."

From Cairo also comes the story that a local government department which had been using high grade Gargoyle products consistently, ceased their purchases. It was found that the native warehouse employees were "pinching" the oil for home cooking purposes.