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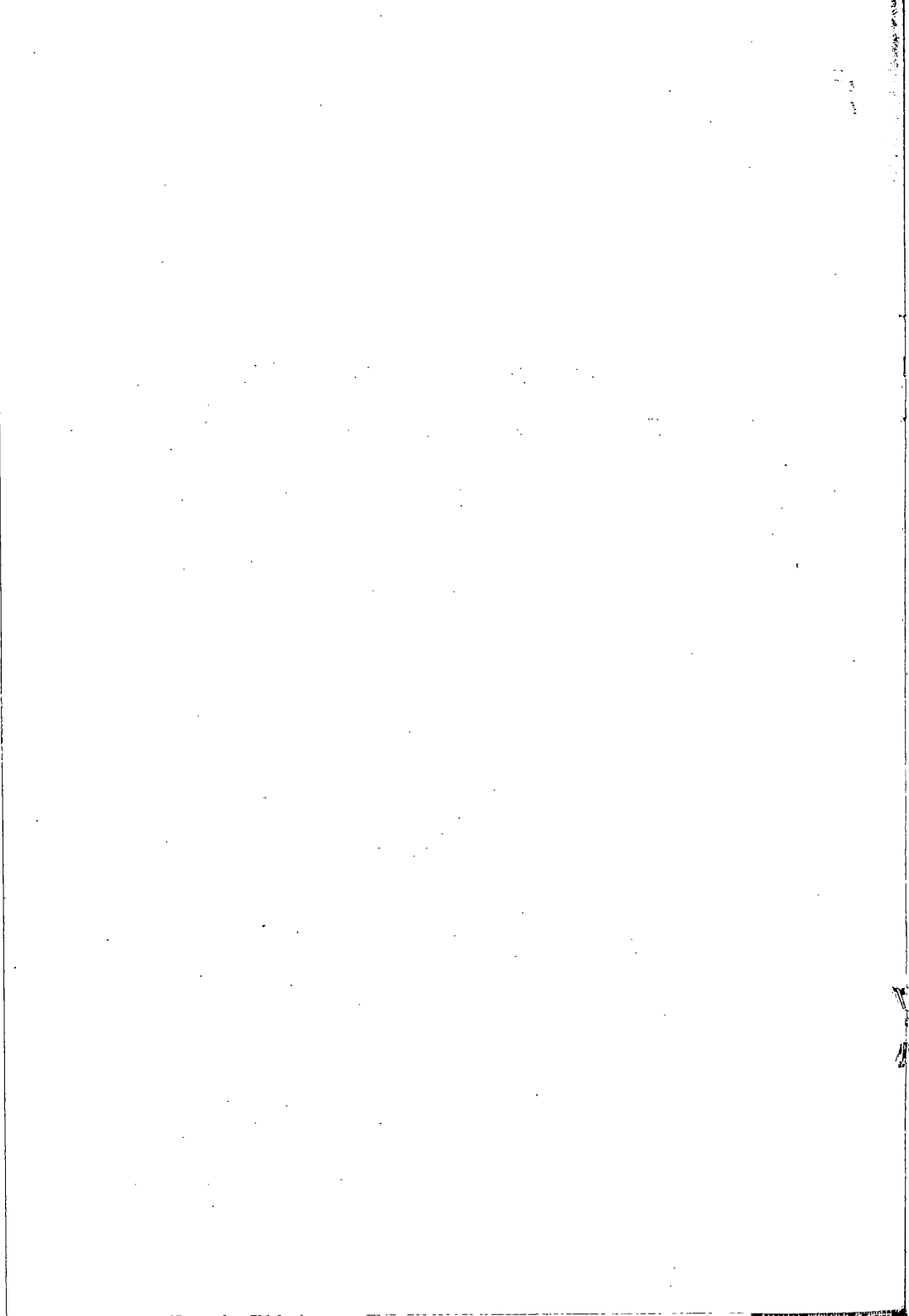
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Report on the Proposed Water
Power Development at Vineland

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Report on the Proposed Water Power Development at Vineland.

CHARLES K. LANDIS, ESQ.,

President of the Maurice River Water and Electric Power Company, of Vineland—

SIR:—I beg to report on the proposed water power development at Vineland as follows:—

MR. C. C. VERMEULE, Engineer for the New Jersey State Geologist, says: "Maurice River is of the same general character as other streams of Southern Jersey, being of very uniform flow, not subject to heavy floods or extreme low water. The fine water power at Millville is a proof of the remarkable steadiness and its value for water power purposes."

There are three sites for development of power, called for convenience "Sherman Avenue", "Almond Road" and "Muddy Run" Dams.

The "Sherman Avenue" Dam will be about one-third of a mile above Sherman Avenue; here nature has provided high banks on the west side for filling material and the swamp bottom is less than 1000 feet wide where the embankment is to be built. This site receives the waters of both Maurice River and Muddy Run.

The "Almond Road" site for dam is on the Maurice River a short distance above the Central R. R.

The "Muddy Run" site is on Muddy Run, and the dam is to be constructed also near the Central R. R.

There are some nine water powers now utilized on Muddy Run above the proposed development.

It is a remarkably steady stream in Summer time when the water is lowest. As all water powers fluctuate during the year and during the different years, the best results can be obtained by combining auxiliary steam

power with the water power during a portion of the year; and the "Almond Road" site being at the railroad, it is advisable to have the auxiliary steam power at that place on account of its convenience for getting fuel.

Sherman Avenue Development.

THIS site affords a fall of twenty feet and with supplementary steam power placed as above stated 420 H. P. can here be obtained twenty-four hours daily, or 840 H. P. per twelve hours

The cost of this plant will be as follows:—

800 acres of land, \$5 per acre,	\$4000 00
Earth, Dam Masonry and Spillway, concrete 150 ft. wide,	40000 00
Excavating tail race,	5000 00
Piling and Crib work below waste way,	3000 00
3 Turbines set,	6300 00
Foundation, Belting and Power House.	6000 00
1 150 H. P. Dynamo	2000 00
1 250 " " "	3000 00
1 350 " " "	4500 00
Wiring to Almond Road works or to Vineland,	8000 00
Engineering and superintendence,	3000 00
Contingencies and Legal exp's,	10000 00

\$94800 00

The plan to locate power house at foot of this dam and dredge the Maurice River to head of Union Pond has several important advantages.—It affords a wide and deep tail race, avoids the waste of water and loss of power by running through a head race, and brings the power house nearer to Vineland.

Almond Road Development.

THIS dam will be on the Maurice River about $\frac{1}{4}$ of a mile from the Central R. R. The water can be raised to the height of sixteen feet above the present level of the River by a head-race to the R. R., and dredging the tail race to the head of the pond below, a fall of 18 feet can be obtained.

By a wing dam on the east side the size of the pond can be reduced to 1000 acres. The spillway will be of concrete 100 feet wide. The Power House will be constructed at lower end of head race near the Central R. R.

For six months in the year we can here obtain 214 H. P. day and night, and by supplementing two 150 H. P. compound condensing engines we will have the power named the whole year, equivalent to 428 H. P. for 12 hours daily.

The cost of this plant will be as follows:—

1000 Acres of Land	\$ 4000 00
Earth, Dam & Masonry	20000 00
Concrete Spillway 100 ft. wide	13000 00
Piling, Crib work below wasteway	2000 00
1-54 in. Turbine set	2200 00
1-42 in. " "	1100 00
Foundation, Belting & Power House	4500 00
1-150 H. P. Dynamo	2000 00
1-350 " "	4500 00
Electric Line to Vineland	5000 00
Engineering & superintendence	2000 00
Excavating Head Race	2700 00
Dredging Tail Race	2000 00
two 150 H. P. Condensing engines & boilers	12500 00
Contingencies & legal expenses	8000 00
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	\$85500 00

Muddy Run Development.

As stated before in this report Muddy Run has a very steady flow the whole year, and the most available plan is to use the bank of an old dam at Landis Avenue and run head race for $\frac{1}{2}$ of a mile along the East side of stream to the Central Railroad where Power House will be located.

By buying or leasing the Union Grove Pond and dredging tail race below the Power House a fall of 20 feet can be obtained.

The estimate of the cost of Muddy Run development is as follows:—

300 Acres of Land including the neglected dam site	3500 00
Earth dam, masonry & wing walls	10000 00
Wooden Spillway 60 feet wide	3000 00
Piling & Crib work below dam	1500 00
Head race from dam to power house	2000 00
Dredging tail race	1000 00
One 30 in. turbine	600 00
“ 42 “	1100 00
Contingent and legal expenses,	2,000 00
Power house foundations and setting turbines	4000 00
One 100 H. P. Dynamo	1500 00
“ 150 “	2000 00
“ 200 H. P. and Compound Condensing Engine and boilers	7000 00
Smoke Stack	500 00
Engineering and superintendence	2000 00
Wiring to Vineland for Electric Lights	5000 00
Purchase of Union Grove Pond with 3 dwellings etc.	7000 00
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	53700 00

From this plant we may expect the following result:
 212 H. P. \$60 per annum, \$12720 00

EXPENSES.

One Superintendent and engineer	\$1200 00
One assistant engineer 6 mos.,	300 00
1 fireman,	210 00
300 tons coal at 2 50 per ton,	750 00
Taxes and insurance,	200 00
Repairs and renewals,	2000 00
Office expenses,	650 00
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	5310 00

Net income, 7411 00

For the proposed Electric lighting, water works and sewerage of Vineland, this plant can furnish the power cheaper than any other competitors.

Allowing 5 per cent interest on the cost of the plant deducted from the net receipts will leave a balance of

\$4726 00 for the stock holders.

Almond Road Development.

Under the conditions before named the out put will be equivalent to 428 H. P. 12 hours daily and 428 H. P. at \$60 per annum, 25680 00

EXPENSES.

Wages of Electrician and Supt.,	\$1500 00
“ “ one Engineer,	720 00
“ “ “ asst. Engineer,	570 00
“ “ “ Fireman, 6 months,	210 00
480 tons coal \$3,	1440 00
Oil waste and supplies.	135 00
Repairs of engines and boilers,	500 00
Taxes, Ins. Genl. repairs and renewals,	2500 00
6 percent interest on cost of plant,	5130 00
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	12705 00

Net earnings after paying expenses and 6 percent on cost, is as follows:—

Annual value of power,	25680 00
“ expenses,	12705 00
Net earnings,	12975 00

The Almond Road development constitutes a complete plant by itself to supply light and power to Vine-land and part of Alliance. but it will be in line with and capable of being readily expanded to a much greater development.

The Sherman Avenue site affords a fall of 20 feet and with supplementary steam power for part of the year we can obtain 420 H. P. day and night. This supplementary steam power should be placed at Almond Road Power House at R. R., as stated before.

By this plan we shall need to install two 300 H. P. condensing engines and generators of 700 H. P. capacity. The cost of the two plants will then be as follows:—

Cost of Sherman Ave. develop- ment as before,	94300 00
Almond road development	85,500 00
2 300 H. P. additional engines and boilers complete	25000 00

2-350 H. P. additional Dynamos,	8000 00
Additional wiring &c,	5000 00

218300 00

The value of the total output and cost of operating two plants, may be estimated as follows:—

1268 H. P. \$60 per annum,	76080 00
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EXPENSES.

Wages 1 Supt. and Electrician,	2000 00
" 2 Engineers,	1440 00
" 2 Asst. Engineers,	1200 00
" 2 Firemen 6 months,	600 00
Oil waste and supplies,	300 00
2000 tons of coal	6000 00
Repairs of engines and boilers,	675 00
Genl. repairs, taxes Ins.,	6000 00
6 percent interest on cost,	13098 00

31313 00

Net profit,

44767 00

From the three plants combined the following results may be expected.

COST.

Sherman Ave. and Almond road plants combined,	218300 00
Muddy Run plant,	53700 00

272000 00

Income from the 3 plants combined 1480 H. P. \$60 per annum,	88800 00
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EXPENSES.

Operating Sherman Ave. and Almond Road plants,	31313 00
Operating Muddy Run plant,	5310 00

36623 00

Net earnings,

52177 00

C. C. Vermeule C. E. of the State Geological Board of N. J. and who has made the reports upon the Water Powers of the State and also the state topographical

surveys and maps, estimates the water power of Muddy Run for 6 months in the year at 106 horse power for 24 hours and 212 horse power for 12 hours. He says, "It seems to me entirely safe to estimate the earnings from these plants to be at the rate of \$60 annually for each net horse power of the wheel plants for 12 hours daily. Earnings of this amount ought to be realized at a minimum, and I believe they can be very considerably exceeded.

This is only one half the cost of steam power in small engines and $\frac{3}{4}$ upon larger engines.

The market for this power will be found in Vineland, Alliance, Brotmanville, Rosenhayn and Carmel, all manufacturing places. What will greatly increase the earnings per horse power over and above the \$60 estimated is the fact that light can be furnished at night, when Industrial plants are not running. It is also safe to sell a considerable excess of actual horse power as the plants are not all running at the same time. To keep the power up to this amount of 212 horse power steam must be supplied at times of the year in order to make the horse power at all times constant and uniform."

If you should get the Electric Lighting of Vineland, Millville and a few other towns near by, the profits will be greatly increased, because this power for an average of 8 hours at night and for at least 6 months in the year would come from water otherwise going to waste.

The net power is about 80 percent of what is produced at the wheels, but it has frequently been demonstrated that by selling power to a number of small takers the full amount can be sold.

This plant should be developed gradually as the power is disposed of, thus saving interest on capital invested and running expenses.

Respectfully submitted,

MARCUS FRY, Local Engineer.

Some Figures giving Prices paid for Power in Other Places.

The Historical Publishing Company pay \$129 per month for 25 Horse Power 10 hours per day; this is equivalent to \$61.92 per annum, per Horse Power,

The Edison Company charge \$234 per annum per H

P. for 1 and 2 H. P. Motors.

The lowest rate in Philadelphia is \$100 per annum for one Horse Power, and for 10 H.P. for 10 hours daily the charge is \$60 per annum.

At Lancaster, Pennsylvania, the charges for electrical power per H. P. to Motors are $11\frac{3}{4}$ cents an hour.

At Pawtucket R. I. the charges are for 1 H. P. annually \$100., and reduced to \$75 annually per H. P. for larger quantities up to 10 Horse Power.

The City of Millville now pays \$78 for each arc light per annum.