CRR 22/5/78

TREATMENT AND DISPOSAL OF POTATO PROCESSING WASTE WATER BY IRRIGATION

UNITED STATES
DEPARTMENT OF
AGRICULTURE

CONSERVATION
RESEARCH REPORT
NUMBER 22

PREPARED BY
SCIENCE AND
EDUCATION
ADMINISTRATION

ABSTRACT

J. H. Smith, C. W. Robbins, J. A. Bondurant, and C. W. Hayden. Treatment and Disposal of Potato Processing Waste Water by Irrigation. U.S. Department of Agriculture Conservation Research Report 22, 37 pp., 1978.

Irrigation with potato processing waste water was studied for 3 years at five locations in southern Idaho. Three of the potato processors surface irrigated and two sprinkled land planted to perennial grasses. The processing season began in October and continued into the following summer. Samples of 24-hour composited waste water and soil water, extracted from depths of 15 to 150 cm, were obtained monthly throughout the year. Analyses were made on all water samples of sufficient volume for chemical oxygen demand (COD), NO_3, total N, total P, ortho P, hydrolyzable P, K, Na, Ca, Mg, Cl, HCO_3, SO_4, electrical conductivity, and pH. Water applications ranged from 160 to 490 cm per year, total N from 1,000 to 2,200 kg, P from 150 to 630 kg, and K from 2,250 to 6,700 kg K/hectare year. COD decreased 95 to 100 percent after passage of the water through 150 cm of soil because of biological activity and filtration. Nitrates were low in one field with a shallow water table because of denitrification that resulted from low redox potentials. Phosphorus concentrations increased 50 to 100 parts per million in the surface 30 cm of soil but not measurably below that depth. K, Na, Ca, and Mg changed in proportion to the amounts applied in the waste water. Irrigation with potato processing waste water provides a means of utilizing part of the nutrients that would otherwise be wasted and solves a difficult environmental pollution problem.

KEYWORDS: Chemical oxygen demand, nitrate, phosphorus, potassium, calcium, magnesium, sodium, electrical conductivity, pH, pollution control, irrigation, waste water.

CONTENTS

Washington, D.C. Issued May 1978

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402

Stock No. 001-000-03780-3

TREATMENT AND DISPOSAL OF POTATO PROCESSING WASTE WATER BY IRRIGATION

By J. H. Smith, C. W. Robbins, J. A. Bondurant, and C. W. Hayden[1]

INTRODUCTION

Irrigating agricultural land with waste water and growing various crops on the land has become a viable alternative to discharging the waste water to streams or treating it in conventional primary and secondary waste treatment systems (*4, 5, 9, 11, 12, 14, 17, 19, 27*).[2] Food processing waste water can be used to irrigate agricultural land for treatment and disposal of the water because it seldom contains toxic constituents. Crops grown on land irrigated with these waste waters can be used for livestock feed. These crops also remove part of the nutrients applied in the waste water (*1*).

Potato processors discharge large volumes of waste water that contain relatively low concentrations of organic matter, suspended solids, and various inorganic constituents, including nitrogen, phosphorus, and potassium. However, because of the large volumes of water, heavy concentrations of fertilizer nutrients frequently build up in the soil as a result of irrigating with this water. Nitrogen, phosphorus, and potassium in the waste water have amounted to 350 to 2,500, 70 to 600, and 700 to 7,700 kilograms per hectare (kg/ha) annually (*23*).

Recently published research results have provided information on potato processing waste water. Loehr (*11*) cited data on water requirements for processing and waste loading per ton of potatoes. Smith and associates published nutrient contents of potato processing waste water (*23, 25*), water loading, organic loading, reduction of chemical oxygen demand (COD) and nitrates in soil (*22*), denitrification in potato processing waste treatment fields (*24*), decomposition of oils associated with cooking potatoes during processing (*20*), and a guide for irrigating with potato processing waste water (*21*).

De Haan and associates (*6, 7*) reported research results from the Netherlands on land disposal of potato starch waste water. They concluded that the systems worked well, that oxygen demand and other constituents, except potassium, were satisfactorily removed at moderate applications, as waste water passed through the soil, and that using the waste water for irrigation could economically benefit farmers.

Robbins and Smith (*18*) investigated phosphorus movement under fields irrigated with potato processing waste water and found that most of the phosphorus is retained in the top of the soil profile with some movement in the organic form that stops with the conversion to inorganic phosphorus forms. They developed an empirical formula for predicting phosphorus movement in relation to the clay-size fraction of the soil.

Sprinkler irrigation with food processing waste water was first tried in the United States in 1947, and since that time its use has greatly increased (*3, 4, 13*). Several potato processors, formerly using other systems such as secondary treatment, have recently converted to land disposal by sprinkling or flooding. Many newer potato processing plants are using some form of land disposal for their waste waters. Because of the widespread use of sprinklers for spreading wastes, concern has developed about possible spread of infectious micro-organisms by sprinkler irrigation with contaminated waste water.

Parker et al. *(16)* conducted tests, using a potato processing waste sprinkler system, where there

---

[1] Soil scientists, agricultural engineer, and biological technician (soils), respectively, Snake River Conservation Research Center, Kimberly, Idaho 83341.

[2] Italic numbers in parentheses refer to Literature Cited, p. 11.

was little or no possibility of spreading infectious organisms, to determine movement of micro-organisms from the waste water that were aerosolized by sprinkling. They determined that micro-organisms can move up to several kilometers, under favorable atmospheric conditions, and that a green belt or other safety border will be ineffective in screening people from spray areas where infectious micro-organisms may be sprayed. Nevertheless, spraying noninfected or disinfected waste water should be relatively safe.

Irrigating with potato processing waste water is a long-season operation. Irrigating begins in the fall with effluent from freshly harvested processed potatoes and continues throughout the winter months and part of the next summer as potatoes are processed from storage. Irrigating with the waste water has been as successful with flooding of graded fields as with sprinkling, when using equipment designed to operate at temperatures below freezing.

The objectives of this paper are to summarize data for (*1*) sprinkler and flood irrigation with potato processing waste water (*2*), loading with nutrients and organic matter (*3*), water cleanup through soil filtration and microbiological activity (*4*), some aspects of nutrient utilization (*5*), some considerations of salinity and specific ions, and (*6*) to discuss the feasibility of continued irrigation with these waste waters.

METHODS AND MATERIALS

This study was conducted at five potato processing plants in southern Idaho where the waste water is used to irrigate cropped fields. Three fields that border nearly level land are irrigated by flooding, and two fields are irrigated by sprinkling. Orchardgrass (*Dactylis glomerata*), tall fescue (*Festuca arundinacea*), reed canarygrass (*Phalaris arundinacea*), and bromegrass (*Bromus inermis*) or mixtures of these species are grown on the fields and harvested for hay or grazed by livestock. Waste water was sampled at each potato processing plant at monthly intervals during most of three processing seasons. An automatic sampler, activated at 20-minute intervals for 24 hours, delivered water into a freezer where it was frozen in a plastic container for storage until it could be analyzed in the laboratory (*8*).

Soil water was sampled monthly, using 3.8-cm-diameter, polyvinyl-chloride sampling tubes with porous ceramic cups cemented to one end. The sampling tubes were inserted vertically into the soil to depths of 15, 30, 60, 90, 120, and 150 cm at each sampling site. When taking samples, approximately 0.7 bar suction was applied to the tubes for about 48 hours. The extracted water was pumped into a suction flask, transferred to a plastic bottle, and taken to the laboratory for refrigerated storage until it could be analyzed. Not every tube yielded a water sample at every sampling.

The water samples were analyzed for COD according to "Standard Methods for the Examination of Water and Wastewater" (*2*). Nitrate-nitrogen was determined with a nitrate-specific ion electrode. Total nitrogen was determined by a Kjeldahl procedure, modified by substitution of copper for the mercury catalyst (*2*). Total phosphorus was determined using persulfate oxidation (*26*) and potassium, by flame photometry. Water applications to the fields were measured by the treatment field operators using meters or other devices. Processing plant waste effluents, water samples extracted with extraction tubes, and saturated soil extracts were also analyzed for sodium by flame photometry; calcium and magnesium, by atomic absorption spectrometry; chloride, by silver titration; bicarbonate, by sulfuric acid titration; sulfate, by precipitation as barium sulfate and read on a spectrophotometer; total dissolved salts, by electrical conductivity, and pH. Soils sampled annually were analyzed for the above constituents; total organic matter, by wet digestion. The first samples were analyzed for cation exchange capacity (CEC) and particle-size distribution from each sampling depth (table 1).

The processing plants with the flood-irrigated fields are referred to as 1-F, 2-F, and 5-F; and the sprinkler-irrigated fields, as 3-S and 4-S. Processing plants 2-F, 4-S, and 5-F use steam peeling and produce dehydrated potato products. Processing plant 1-F uses dry lye peeling and produces frozen french fried potatoes and other products. Processing plant 3-S used wet lye peeling the first season of the study, then converted to dry lye peeling. The plant produces dehydrated potato products and starch.

TABLE 1.—*Particle-size distribution and soil types at potato processing waste water treatment sites*

Treatment field	Soil depth	Clay	Sand	Silt	Soil type
	Cm		*Percent*		
1-F, site 1	0-15	19.4	35.4	45.2	Loam.
	15-30	18.4	36.4	45.2	Do.
	30-60	33.2	12.4	54.4	Silty clay loam.
	60-90	16.4	43.4	40.2	Loam.
	90-120	13.6	54.9	31.5	Sandy loam.
	120-150	8.6	73.7	17.7	Sandy loam, loamy sand.
1-F, site 2	0-15	16.2	49.8	34.0	Loam.
	15-30	20.2	45.8	34.0	Do.
	30-60	14.2	53.8	32.0	Sandy loam.
	60-90	4.0	86.7	9.3	Sand, loamy sand.
	90-120	2.9	89.8	9.3	Sand.
	120-150	2.9	89.8	9.3	Do.
2-F, site 1	0-15	17.8	45.8	36.4	Gravelly loam.
	30-60	5.7	84.8	9.5	Gravelly loamy sand.
	60-90	1.8	96.5	1.7	Gravelly sand.
	90-120	1.8	97.0	1.2	Do.
	120-150	1.8	96.9	1.3	Do.
2-F, site 2	0-15	16.2	57.2	26.6	Sandy loam.
	15-30	18.2	50.0	31.8	Loam, sandy loam.
	30-60	9.0	66.3	24.7	Sandy loam.
	60-90	5.5	71.8	22.7	Do.
	120-150	5.5	57.8	36.7	Do.
	150-175	6.0	69.8	24.2	Do.
3-S, site 1	0-30	20.6	42.4	37.0	Loam.
	30-60	15.4	53.6	31.0	Sandy loam.
	60-90	6.7	82.3	11.0	Loamy sand.
	90-120	13.7	56.8	29.5	Sandy loam.
	120-142	7.1	78.4	14.2	Loamy sand.
3-S, site 2	0-30	15.2	61.8	23.0	Sandy loam.
	30-60	15.2	45.8	39.0	Loam.
	60-90	10.1	67.4	22.5	Sandy loam.
	90-120	10.1	67.4	22.5	Do.
	120-150	5.6	65.8	28.6	Do.
4-S, site 1	0-30	18.4	50.4	31.2	Loam, sandy loam.
	30-60	19.4	42.4	38.2	Loam.
	60-90	9.1	68.6	22.3	Sandy loam.
	90-120	6.1	83.7	10.2	Loamy sand.
	120-150	3.9	90.0	6.1	Sand.
4-S,[1] site 2	0-15	25.6	41.0	33.4	Loam.
	15-30	26.6	37.0	36.4	Do.
	30-60	13.7	24.0	62.3	Silt loam.
	60-90	9.2	17.0	73.8	Do.
	90-120	6.1	11.7	82.2	Silt.
	120-150	5.6	8.6	85.8	Do.
4-S,[1] site 2A	0-15	13.4	62.4	24.2	Sandy loam.
	15-30	15.8	59.6	24.6	Do.
	30-60	18.8	48.8	32.4	Loam.
	60-90	18.8	43.8	37.4	Do.
	90-120	12.4	70.8	16.8	Sandy loam.
	120-150	9.4	73.4	17.2	Do.

See footnote at end of table.

TABLE 1.—*Particle-size distribution and soil types at potato processing waste water treatment sites —Continued*

Treatment field	Soil depth	Clay	Sand	Silt	Soil type
	Cm	*Percent*			
5-F, site 1	0-30	12.1	66.1	21.8	Sandy loam.
	30-60	17.4	49.2	33.4	Loam.
	60-90	14.4	47.2	28.4	Loamy sand, sandy loam.
	90-120	16.8	52.8	30.4	Sandy loam.
	120-150	15.8	51.0	33.2	Loam, sandy loam.
	150-175	26.0	23.8	50.2	Silt loam, loam.
5-F, site 2	0-30	17.8	38.0	44.2	Loam.
	30-60	13.3	63.8	22.9	Sandy loam.
	60-90	22.8	25.8	51.4	Silt loam.
	90-120	18.8	31.8	49.4	Silt loam, loam.
	120-150	21.0	24.8	54.2	Silt loam.
	150-240	8.9	75.8	15.3	Sandy loam.

---

[1] Site destroyed by livestock, October 1973. Moved to new location, November 1973. Later samplings were at site 2A.

RESULTS AND DISCUSSION

Waste Effluent Analyses and Application

The nitrogen, phosphorus, and potassium concentrations in the waste water and annual applications are reported in table 2 as averages by years of all the samples obtained from each processing plant during 1973, 1974, and 1975. The nitrogen is primarily organic with mean nitrate-nitrogen concentrations of less than 2 milligrams per liter. Phosphorus in the waste water averaged 32 percent ortho, 22 percent acid hydrolyzable, and 46 percent organic. Total nitrogen in the waste water ranged from 32 to 133 mg/ℓ; total phosphorus, from 6 to 21 mg/ℓ; and total potassium, from 75 to 158 mg/ℓ.

Annual waste water applications ranged from 27 to 546 cm (table 2). The waste water at most of the potato processing plants was screened to remove potato pieces, passed through a clarifier, and the settled solids were removed by vacuum filtration. The filter cake, containing 10 to 15 percent solid material, was ensiled for livestock feed.

Nitrogen applied to the land in the waste water ranged from 350 to 2,550 kg/ha annually. The lowest nitrogen application can probably be utilized by a good grass crop in this climatic area, but higher rates exceed crop requirements. De Haan et al. (*7*) developed an efficiency index for nitrogen, phosphorus, and potassium fertilizer value from potato starch waste. On potatoes and beets, the nitrogen value was 0.5; on cereals, 0.2; and on grass, 0.8. The phosphorus value was 0.5 on the four crops, and the potassium value was 0.8 on three crops and 0.4 on cereals. Similar fertilizer efficiency values need to be developed for nutrients in our processing wastes.

Phosphorus applied to the land in the waste water ranged from 70 to 630 kg/ha. These applications exceeded the phosphorus requirements for most crops, and phosphorus increased in the soil as a result of irrigation with potato processing waste water. During 3 years of irrigation with the waste waters studied, the bicarbonate extractable soil phosphorus increased approximately 40 parts per million (p/m) in the top 30 cm of soil, with smaller increases below that depth (table 3). Total phosphorus in the top 60 cm of soil increased 100 to 130 p/m during 3 years irrigation with potato processing waste water. (For a more detailed discussion of phosphorus considerations in this study, see *18.*)

The potassium applied to the soil in the waste water exceeded the potassium requirements of grass (table 2). Potassium concentration in the soil

TABLE 2.—*Annual waste water and chemical oxygen demand (COD) applications; mean nitrogen, phosphorus and potassium concentrations; and annual applications in waste water from 5 potato processing plants*[1]

Treatment fields and year	Water Applied	COD	Nitrogen		Phosphorus		Potassium	
	Cm	*Tons/ha*	*Mg/l*	*Kg/ha*	*Mg/l*	*Kg/ha*	*Mg/l*	*Kg/ha*
1-F:								
1973	546	58.6	52	2,550	10	630	114	5,750
1974	460	85.1	47	2,130	13	630	162	7,730
1975	260	29.9	50	1,500	12	300	130	3,180
2-F:								
1973	125	9.5	32	400	6	80	75	930
1974	209	15.6	33	610	6	110	94	1,880
1975	174	15.6	35	640	6	120	88	1,840
3-S:								
1974	119	35.2	91	1,500	21	150	180	2,670
1975	161	34.8	133	1,720	16	220	250	3,540
4-S:								
1973	246	20.2	52	760	9	120	132	2,490
1974	78	15.4	52	670	8	110	111	1,910
1975	27	12.1	43	350	8	70	77	680
5-F:								
1973	266	40.9	59	980	9	160	150	2,540
1974	201	27.0	44	950	8	170	158	2,670
1975	278	35.9	51	1,420	10	280	104	2,830

---

[1] Monthly applications and concentrations were used for calculating annual values.

TABLE 3.—*Bicarbonate extractable orthophosphate and total phosphorus from 2 waste disposal sites*[1]

Soil depth (meters)	Bicarbonate extractable orthophosphate				Total phosphorus			
	1972	1973	1974	1975	1972	1973	1974	1975
	Plant 5F - Site 2							
	Parts per million							
0.0 - 0.3	11.0	25.7	51.3	47.0	720	759	816	825
.3 - .6	4.2	17.6	15.7	18.0	642	687	684	820
.6 - .9	—	18.2	17.5	18.1	638	654	804	795
.9 - 1.2	3.6	16.9	15.4	15.0	726	732	724	710
1.2 - 1.5	3.5	15.1	14.7	13.8	708	735	708	730
	Plant 1F - Site 1							
.0 - .3	40.6	—	52.5	62.0	531	—	405	611
.3 - .6	20.0	—	31.6	42.1	439	—	525	575
.6 - .9	9.4	—	13.8	21.8	419	—	342	450
.9 - 1.2	11.3	—	16.5	19.0	392	—	475	468
1.2 - 1.5	6.6	—	10.0	17.7	401	—	454	396

---

[1] Dashes in columns indicate no data.

solution is expected to increase until it reaches equilibrium with the soil, after which the excess will be leached.

The waste water treatment fields at each of the five potato processing plants were chemically characterized and reported in Appendix table 1. CEC ranges from 5 to 11 milliequivalents per liter in the surface 30 cm of soil and from 2 to 15 meq/ℓ in the bottom-sampled layer of the profile. The soil pH at each location was neutral to slightly alkaline, with little change taking place because of waste water irrigation. Electrical conductivity (EC) measured at the conclusion of the experiment showed all of the surface 30 cm samples to be below 1 μmhos, which indicates no salinity problems. Chlorides and bicarbonates in the soils were similar to those found in the applied waste water. Organic matter in the soil appears to be increasing in the top 30 cm of most of the soils after 3 or 4 years of irrigating with waste water and growing perennial grass crops.

Exchangeable sodium, potassium, calcium, and magnesium in the soils were within acceptable limits in the soils. The only area of concern might be the sodium concentrations in the soil at treatment field 1-F site 1 where sodium was higher than in the other fields because of initial soil salinity. Exchangeable sodium percentages (ESP) in the soils are decreasing except in the sprinkler irrigated fields. Total Kjeldahl nitrogen (TKN) in the soils was determined and is reported for 1976 at the conclusion of the field soil sampling.

Wintertime irrigation poses some special problems in cold climates. Waste water at 15° C infiltrated at each flood irrigation in the winter even when the air temperature was below minus 40. With sprinkler irrigation, ice, which accumulated in mounds around the sprinklers, remained until air temperatures were above freezing. Ice accumulation occurs because water leaving the sprinkler nozzle approaches dewpoint temperature before the droplet reaches the ground, regardless of the water temperature in the sprinkler nozzle (*15*). Melting was usually slow enough to allow infiltration of the ice melt water, and no major problems were observed. Nevertheless, field design must include retaining structures to prevent runoff from the treatment fields.

Organic matter removal was similar for both irrigation methods, but higher nitrates were found in the soils under sprinklers than under flood irrigation. The nitrate difference in the fields probably did not result from different irrigation methods. Less water was applied on the sprinkled fields than on the flooded fields, so less leaching would be expected under sprinklers. The sprinkled fields yielded less grass than the flooded fields because of inadequate summertime irrigation.

Chemical Oxygen Demand Applications

Mean COD concentrations in the waste water ranged from 765 to 3,080 mg/ℓ. This range resulted from different peeling and handling processes. The high COD concentrations in the waste water at plant 3-S resulted from not using vacuum filtration. COD concentrations in the waste water vary from time to time, depending upon the quality of potatoes and the amount of water being used in the process. Organic matter, reported as COD, applied to the waste treatment fields in the waste water varied from approximately 10 to 85 tons/ha.

At processing plant 1-F, the high application rates in 1973 and 1974 were decreased as more land was irrigated with waste water. The lower amounts were applied at plant 2-F because the disposal system was designed to utilize the total plant effluent at conservative rates. After construction work was completed and a grass cover was established, irrigation with waste water was begun. The system has worked exceptionally well from the beginning.

Potato processing plant 5-F had the first waste water irrigation system for potato wastes in Idaho. Settling of recently leveled land caused ponding in low areas where anaerobic conditions developed, which killed the grass. Long stretches of open ditch, carrying water in the field, became anaerobic and created highly objectionable odors. The odor problem was corrected by installing underground distribution pipe in the field and eliminating the open ditches. Low spots in the field were filled with soil and reseeded with grass. The grass in each waste water treatment field was either grazed by livestock or harvested for hay. Harvesting hay removed more plant nutrients from the field and is a better practice than grazing with livestock. Livestock are inefficient in removing nutrients, and most of the plant nutrients are redeposited in the field where fertility is already very high from waste water fertilization. Livestock trampling the soil also decrease water infiltration and create some problems.

Chemical Oxygen Demand in Waste Water and in Water Extracted from the Treatment Fields

Obtaining water from the sprinkled fields was difficult. In the winter, soil and sampling sites were covered much of the time with ice. Even when the sites were not covered with ice, water extraction was difficult. In the summer, when the processing plants were not operating, the fields were insufficiently irrigated for normal grass growth, and the soil was often too dry to yield water samples. Under these conditions, ground water pollution was not a problem because little water passed through the soil.

In the surface-irrigated fields, we consistently extracted water samples from the soil during the entire year. At most of the sampling sites, a large number of water samples were extracted during 2 or 3 years of sampling. Appendix table 2 shows COD in waste water samples and from samples extracted from the soil at depths of 15 to 150 cm during 2 or 3 years of sampling at five potato processing waste water treatment fields. At locations 1-F through 5-F, the mean COD removal ranged from 95 to 98 percent at the 150-cm depth. Some organic matter is always present in soil solution, and the COD values observed at the 150-cm depth in the soil probably represent almost complete cleanup of the organic matter in the waste water applied to these waste treatment fields.

Cleanup of the organic and inorganic constituents of the waste water is accomplished by several mechanisms. Particulate matter is filtered from the water as it passes through the soil. Much of the organic matter in the water is relatively low in molecular weight and is easily degraded by micro-organisms. Therefore, the soil micro-organisms utilize the organic wastes for energy and nutrients. Some electrically charged components are attracted to soil particles and are removed by these physical forces. In total, biological,.physical, and chemical forces in the soil remove nearly all of the objectionable waste materials from the waste water as it passes through the soil.

Nitrogen in Waste and Extracted Water Samples

TKN in the waste water samples and in the water samples extracted from the waste water treatment fields for the total time of the experiment are presented in Appendix table 3. TKN in the waste water samples ranged from 30 to 130 mg/ℓ and did not include nitrates. Most TKN concentrations in the soil water were 2 mg/ℓ or less at the 150-cm depth. TKN in the soil water samples followed the same trends as COD, decreasing with depth in soil. Most of the waste water samples had a COD: nitrogen ratio of 20 or 25 to 1, indicating that nitrogen was not a limiting factor in organic matter decomposition. The 4 to 5 percent nitrogen represented by these ratios will furnish more nitrogen than needed for rapid organic matter decomposition when other factors, such as soil temperatures, are favorable.

Nitrate-nitrogen concentration in the waste water was low. The average for all locations and samplings was only 1.2 mg/ℓ (Appendix table 4). Nitrate-nitrogen in the soil water samples correlates more closely with TKN than with nitrate-nitrogen in the waste water. Most of the nitrogen in the waste water is organic. Decomposition of the waste water organic fraction yields nitrate as one of the end products and thereby makes a good correlation between nitrate production and waste water TKN. Low nitrate concentrations were observed in the flood fields most of the time. At plants 1-F and 5-F, the low concentration resulted from denitrification brought about by a water table in the 1- to 3-m depths in the soil. At field 5-F, a site was instrumented with platinum electrodes from the surface to 150-cm depth, and redox potentials were measured.

The very low redox potentials (below minus 400 millivolts), measured below 60 cm in the soil, confirmed conditions favorable for denitrification (*23*). Redox measurements at processing plant 2-F, without a shallow water table, showed low potentials after irrigation with waste water in warm weather, which would promote some denitrification during irrigation cycles. At other times, redox potentials were not low enough to cause denitrification. Nitrate concentrations in the soil water samples were highest in fields 3-S and 4-S. Equipment maintenance shutdowns, during the early summer months at both locations, prevented irrigation for

TABLE 4.—Total phosphorus concentration in potato processing plant waste water and phosphorus fractions in waste water and soil water extracted from the 1.5-m depth in treatment fields[1]

Processing plant	Total phosphorus in effluent	Phosphorus fraction in effluent			Phosphorus fraction in soil water from the 1.5-m depth		
		Ortho	Hydrolyzable	Organic	Ortho	Hydrolyzable	Organic
	Parts per million	*Percent*			*Percent*		
1-F	12.8 ± 4.0[2]	43	19	38	64	20	16
2-F	5.9 ± 2.3	28	23	49	67	17	16
3-S	21.8 ± 16.9	29	19	52	—	—	—
4-S	8.0 ± 1.8	31	23	46	—	—	—
5-F	9.5 ± 2.7	30	25	45	61	21	18

[1] Dashes in columns indicate no data.

[2] Mean concentration ± standard deviation.

maximum grass production. Consequently, nitrates accumulated to greater concentrations than they would have if the grass had grown for maximum yield.

Phosphorus and Potassium in Waste Water and Extracted Soil Water

Total phosphorus concentrations in the waste water from the potato processing plants ranged from 4 to 39 mg/ℓ (Appendix table 5). The phosphorus fractions in the waste water and in the soil extracts from the 1.5-m depth are given in table 4. The percentage of orthophosphate increased with passage through soil, while hydrolyzable phosphorus did not change, and organic phosphorus decreased. Some data indicate organic movement with microbial conversion to orthophosphate at some depths in the soil (*18*). The total phosphorus concentrations in all the waste water samples and in the soil water extracts are given in Appendix table 5. Phosphorus concentrations in the soil were very low at three sites at 1.5 m in the soil. Two sites had higher phosphorus concentrations, indicating phosphorus movement. An explanation for this was presented earlier in this paper.

Potassium concentrations in the waste water samples ranged from 1 to 8 meq/ℓ with most of the samples in the range of 2 to 5 meq/ℓ. (Appendix table 6). Potassium concentrations in the soil water at the 1.5-m depth were 55 to 95 percent lower than in the waste water, indicating a large accumulation of potassium in the soils of the waste treatment fields. This accumulation is expected to continue until the soils become saturated and an equilibrium is reached; afterward, the leaching concentration will be similar to that in the waste water. Potassium may contribute to a salinity problem, if one exists, but there has been no evidence of this occurring except where salinity was a problem before waste water irrigation was started.

Calcium, Magnesium, Sodium, Electrical Conductivity, and pH

Calcium concentrations in the waste water and soil water extracted from several depths are reported in Appendix table 7. The waste water calcium concentrations ranged from 1 to 6 meq/ℓ and were similar at all of the processing plants. During the first year of water sampling at plant 1-F, calcium concentrations in the soil extracts reached 40 meq/ℓ. These soils were historically saline because of a high water table. When the processing plant started pumping water for its operation, the water table was lowered, the soil surface dried out enough for cultivation, and the salinity problem could be corrected. After one year of irrigating with waste water, the calcium concentrations were generally less than 5 meq/ℓ. At plant 3-S, calcium concentrations were fairly high for a few samplings and then decreased. A fairly large amount of calcium was leached from all the treatment fields during the 3 or more years of observations. The calcium and other elements were part of the salts leaching from the fields.

The waste water magnesium concentrations ranged from 0.4 to 2.7 meq/ℓ (Appendix table 8). Following the first year of sampling at plant 1-F, where the magnesium concentrations reached 20 meq/ℓ, the soil water magnesium concentrations were mostly between 1 and 5 meq/ℓ. More magnesium appears to be leaching from the waste treatment fields than is being applied in the waste water.

Sodium concentrations in the waste water varied, depending upon the type of potato peeling system used (Appendix table 9). At plant 1-F, dry lye peeling was used, and losses of sodium hydroxide varied, causing the sodium in the waste water to fluctuate from 1.8 to 16.7 meq/ℓ, with most of the values being around 5 or 6 meq/ℓ. At processing plant 3-S, wet lye peeling was used the first year the waste irrigation field was operated, and sodium concentrations reached 27 meq/ℓ. After changing to dry lye peeling, the sodium concentrations decreased, but a high concentration was occasionally observed. The other three plants used steam peeling, and sodium concentrations were generally low, with most samples in the 1- to 4-meq/ℓ range.

Large quantities of sodium were leached from the fields at plant 1-F, but concentrations in the field were still higher than in the waste water after 3 years of waste water irrigation. The sodium concentration in the field was a carryover from the previously saline field conditions. Leaching of excess sodium can be expected to continue until an equilibrium is reached with the processing waste water.

EC on waste water and on soil extracts is reported in Appendix table 10. The high initial EC values in the top 90 cm of soil at plant 1-F and the increase and then decrease in values at deeper depths illustrate again that salt leaching resulted from waste water irrigation of previously saline soils. During 3 years of irrigation, EC values in the surface soils decreased greatly. The total soil profile salinity also decreased.

The waste water and soil water samples pH are reported in Appendix table 11. The waste water reaction was generally slightly acidic, but because of the organic content of the waste water, the pH was subject to rapid change. We froze the waste water samples and retained them frozen until analyses were started. In frozen water samples, pH was stable, but warm waste water in storage, transit, or the field, could very rapidly become more acid. The pH of the soil solution samples ranged from 6.5 to 8.3 with a few samples slightly higher.

Chloride, Sulfate, and Bicarbonate in Water Samples

Appendix tables 12, 13, and 14 contain data on chloride, sulfate, and bicarbonate concentrations in the waste water samples and the soil water extracts from the waste treatment fields. In the water samples from treatment field 1-F, the sulfate, chloride, and bicarbonate ions were initially high but decreased to much lower concentrations after a few months of waste water irrigation. These anion concentrations were relatively low in all of the waste water samples. The soil water samples after the first few months were slightly higher in concentrations of the three anions than were the waste water samples. Bicarbonate was the predominant anion in the waste water and the soil solution samples.

Composition of Harvested Grass Hay

The TKN, nitrate, phosphorus, and potassium concentrations in the grass hay grown on the waste water treatment fields at five locations are reported in table 5. The TKN measurements include nitrates and, in most cases, are fairly high, ranging from 1.44 to 4.89 percent nitrogen. Nitrate concentrations in most grass samples were below the concentrations that would cause poisoning in livestock. Some nutritionists think that values below 2,000 p/m nitrate-nitrogen are safe for livestock feeding (*10*). With proper conditioning, the livestock can be fed higher nitrate feeds, but caution should be exercised to mix high nitrate feeds with low nitrate feeds and to increase the high nitrate portion in the rations gradually. Phosphorus concentrations in the grass hay samples range from adequate (0.14 percent) to high (0.56 percent). Potassium concentrations are also high.

SUMMARY

1. Nitrogen, phosphorus, and potassium concentrations in potato processing waste water vary widely. The amount of waste water being applied in the irrigation systems discussed in this report provides large amounts of nutrients for field-grown crops. In some cases, the applications are exces-

TABLE 5.—*Total Kjeldahl nitrogen (TKN), nitrate nitrogen, phosphorus, and potassium in grass harvested from potato processing waste water treatment fields*[1]

Treatment field and site	Harvest date	TKN	Nitrate-nitrogen	Phosphorus	Potassium
		Percent	*P/m*	*Percent*	*Percent*
1-F:					
Site 1	4-25-73	2.53	712	0.39	3.76
Site 2	5-31-73	2.00	850	.35	2.77
Site 1	9-13-73	2.45	<450	.44	3.59
Site 2	9-13-73	3.13	950	.35	3.63
Site 1	10-4-73	2.94	1,300	.43	4.06
Site 2	10-4-73	3.18	520	.33	2.93
Site 1	6-5-74	2.14	1,425	.39	3.57
Site 2	6-5-74	2.46	1,825	.28	2.81
Site 1	9-30-74	2.00	2,740	.35	2.05
Site 2	9-30-74	2.23	1,770	.27	3.63
Site 1	7-23-75	2.93	200	.42	3.63
Site 2	7-23-75	2.79	200	.31	3.28
2-F:					
Site 1	6-27-73	1.79	400	.20	2.71
Site 2	6-27-73	1.99	740	.29	1.62
Site 2	10-5-73	1.44	400	.14	1.40
Site 1	6-5-74	2.53	1,100	.35	3.55
Site 2	6-5-74	2.09	675	.33	3.18
Site 1	8-30-74	2.10	600	.33	2.57
Site 2	8-28-74	1.39	105	.27	.78
Site 1	6-13-75	4.06	820	.44	3.51
Site 2	6-13-75	3.61	1,200	.40	3.16
Site 1	8-13-75	3.32	2,950	.39	3.10
Site 2	8-13-75	3.29	4,200	.33	3.45
Site 1	5-31-76	3.66	2,280	—	—
Site 2	5-31-76	2.57	1,500	—	—
Composite	8-76	2.50	400	—	—
3-S:					
Site 2	6-5-74	3.28	1,425	.39	2.96
4-S:					
Site 1	5-31-73	3.25	2,500	.50	4.25
Site 2	6-29-73	2.80	1,900	.32	3.49
Site 1	11-2-73	2.55	700	.35	2.81
Site 2	9-12-73	3.11	1,550	.28	2.52
Site 1	6-5-74	2.73	2,250	.50	3.28
Site 2	6-5-74	3.22	1,100	.52	3.35
Site 1	6-5-75	4.44	670	.56	3.86
5-F:					
Site 1	5-30-73	3.22	2,500	.41	4.19
Site 2	5-31-73	2.87	2,200	.35	4.33
Site 1	8-1-73	2.39	1,900	.35	3.47
Site 2	8-3-73	2.32	1,600	.34	3.78
Site 1	6-5-74	2.43	550	.37	3.82
Site 2	6-5-74	2.31	—	.32	3.51
Site 1	9-6-74	2.37	540	.34	2.11
Site 2	9-6-74	2.87	1,030	.33	3.02
Site 1	6-5-75	4.89	1,550	.52	4.54

---

[1] Dashes in columns indicate no data.

sive, and much more efficient use could be made of the nutrients by irrigating larger land areas.

2. The amount of waste water applied ranged from approximately 25 to 550 cm/year. With proper land preparation to avoid ponding and with drying periods between irrigations to avoid development of anaerobic field conditions, water from these irrigations infiltrates the fields without causing water logging problems.

3. The annual organic loading of 10 to 85 tons COD/ha was assimilated by the soils without anaerobiosis developing near the surface; therefore, organic loading is not a limiting factor in operating waste water treatment and disposal fields like those studied.

4. On waste water treatment and disposal fields, where a water table lies within 1 to 3 m of the surface, nitrates are not likely to be a problem even when 2 to 3 tons/ha of nitrogen are applied annually because denitrification removes excess nitrogen. In fields without a shallow water table, nitrogen application may have to be reduced to prevent excessive nitrate leaching and possible ground water pollution.

5. Waste water from wet lye peel potato processing is not suitable for long-term irrigation of agricultural land for growing crops. Waste water from dry lye peeling systems that keep the sodium hydroxide separated from the waste water effluent and waste water from steam peel potato processing plants can be used successfully for irrigating cropped agricultural land. Irrigating with waste water utilizes some of the water and nutrients that were wasted when the water was discharged into streams and rivers.

6. The research and observations made during several years indicate that potato processing waste water irrigation of cropped agricultural land can be successfully used for a long time to come.

LITERATURE CITED

(1) ADRIANO, D. C., ERICKSON, A. E., WOLCOTT, A. R., and ELLIS, B. G.
1974. CERTAIN ENVIRONMENTAL PROBLEMS ASSOCIATED WITH LONG-TERM LAND DISPOSAL OF FOOD PROCESSING WASTES. *In* Proc. 1974 Cornell Agr. Waste Mangt. Conf., N.Y. State Col. Agr. Life Sci., Ithaca, N.Y.: 222–233.

(2) AMERICAN PUBLIC HEALTH ASSOCIATION, INC.
1971. STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER. Ed. 13, 874 pp. New York.

(3) ANDERSON, D. J., and WALLACE, A. T.
1971. INNOVATIONS IN INDUSTRIAL DISPOSAL OF STEAM PEEL POTATO WASTE WATER. *In* Pac. N. W. Ind. Waste Mangt. Conf. Proc., Univ. of Idaho, Moscow: 45–61.

(4) BOLTON, P.
1947. CANNERY WASTE DISPOSAL BY FIELD IRRIGATION. Food Packer 38: 42–43, 46.

(5) BUTLER, R. M., WOODING, N. H., and MYERS, E. A.
1974. SPRAY-IRRIGATION DISPOSAL OF WASTE WATER. Pa. State Univ. Spec. Cir. 185: 17 pp.

(6) DE HAAN, F. A. M., and ZWERMAN, P. J.
1973. LAND DISPOSAL OF POTATO STARCH PROCESSING WASTE WATER IN THE NETHERLANDS. *In* Proc. 1973 Cornell Agr. Waste Mangt. Conf., N.Y. State Col. Agr. Life Sci., Ithaca, N.Y.: 222–228.

(7) ——— HOOGEVEEN, G. J., and RIEM VIS, F.
1973. ASPECTS OF AGRICULTURAL USE OF POTATO STARCH WASTE WATER. Neth. Jour. Agr. Sci. 21: 85–94.

(8) FISHER, H. D., and SMITH, J. H.
1975. AN AUTOMATIC SYSTEM FOR SAMPLING PROCESSING WASTE WATER. Soil Sci. Soc. of Amer. Proc. 39(2): 382–384.

(9) GURNHAM, C. F., and NEDVED, T. K.
1974. TREATABILITY STUDIES OF THREE FOOD PROCESSING PLANT WASTEWATERS. Purdue Univ. Engin. Ext. Ser. Bul. 145, part 1: 283–289.

(10) HILL, R. M., OGDEN, R. L., and ACKERSON, C. W.
1972. NITRATE TOXICITY IN FORAGE, FACT OR FICTION? Nebr. Farm Ranch and Home Quart. (Fall 1972: 18–20).

(11) LOEHR, R. C.
1974. AGRICULTURAL WASTE MANAGEMENT, PROBLEMS, PROCESSES, APPROACHES. Academic Press, Inc. New York: 576 pp.

(12) MEYER, J. L.
1974. CANNERY WASTE WATER FOR IRRIGATION AND GROUND WATER RECHARGING. Calif. Agr. 28(8): 12.

(13) NORUM, E. M.
1975. LAND APPLICATION OF POTATO PROCESSING WASTES THROUGH SPRAY IRRIGATION. Amer. Soc. Agr. Engin. Paper No. 75–2514. Presented at winter meeting, Chicago, Ill., Dec. 15–18, 1975.

(14) OVERMAN, A. R., and HSIAO-CHING, KU.
1976. EFFLUENT IRRIGATION OF RYE AND RYEGRASS. Jour. Envir. Engin. Div., Amer. Soc. Civ. Engin. 102(EE2): 475–483.

(15) PAIR, C. H., WRIGHT, J. L., and JENSEN, M. E.
1969. SPRINKLER IRRIGATION SPRAY TEMPERATURES. Amer. Soc. Agr. Engin. Trans. 12(3): 314–315.

(16) PARKER, D.T., SPENDLOVE, J. C., BONDURANT, J. A., and SMITH J. H.
1977. JOUR. WATER POLLUT. CONTROL FED. 49(12): 2359-2365.

(17) PEARSON, G. A., KNIBBE, W. G. J., and WORLEY, H. L.
1972. COMPOSITION AND VARIATION OF WASTE WATER FROM FOOD PROCESSING PLANTS. U.S. Dept. Agr., Agr. Res. Serv. ARS 41–186, 10 pp.

(18) ROBBINS, C. W., and SMITH, J. H.
1977. PHOSPHORUS MOVEMENT IN CALCAREOUS SOILS IRRIGATED WITH POTATO PROCESSING PLANT WASTE WATER. Jour. Envir. Qual. 6(2): 222–225.

(19) SHANNON, S., VITTUM, M. T., and GIBBS, G. H.
1968. IRRIGATING WITH WASTE WATER FROM PROCESSING PLANTS. N.Y. State Agr. Expt. Sta., Geneva, Cornell Univ. Res. Cir. 10: 9 pp.

(20) SMITH, J. H.
1974. DECOMPOSITION IN SOIL OF WASTE COOKING OILS USED IN POTATO PROCESSING. Jour. Envir. Qual. 3(3): 279–281.

(21) ———
1975. SPRINKLER IRRIGATION OF POTATO PROCESSING WASTE WATER FOR TREATMENT AND DISPOSAL ON LAND. *In* Wastewater Resource Manual, Edward Norum, ed., Sprinkler Irrigation Assoc., Silver Spring, Md.: pp. 2C/21–29.

(22) SMITH, J. H.
1976. TREATMENT OF POTATO PROCESSING WASTE WATER ON AGRICULTURAL LAND. Jour. Envir. Qual. 5(1): 113–116.

(23) ——— ROBBINS, C. W., and HAYDEN, C. W.
1975. PLANT NUTRIENTS IN POTATO PROCESSING WASTE WATER USED FOR IRRIGATION. *In* Proc. 26th Ann. Pac. N. W. Fert. Conf., Salt Lake City, Utah, July 15–17, 1975: 159–165.

(24) ——— GILBERT, R. G., and MILLER, J. B.
1976. REDOX POTENTIALS AND DENITRIFICATION IN A CROPPED POTATO PROCESSING WASTE WATER DISPOSAL FIELD. Jour. Envir. Qual. 5(4): 397–399.

(25) ——— ROBBINS, C. W., BONDURANT, J. A., and HAYDEN, C. W.
1977. TREATMENT OF POTATO PROCESSING WASTE WATER ON AGRICULTURAL LAND: WATER AND ORGANIC LOADING, AND THE FATE OF APPLIED PLANT NUTRIENTS. *In* Proc. 1976 Cornell Agr. Waste Mangt. Conf., April 28–30, 1976, Rochester, N.Y.

(26) UNITED STATES ENVIRONMENTAL PROTECTION AGENCY.
1974. METHODS FOR CHEMICAL ANALYSIS OF WATER AND WASTES. U.S. Envir. Protection Agency: 298 pp.

(27) WHITE, J. W., JR.
1973. PROCESSING FRUIT AND VEGETABLE WASTES. *In* Symposium on Processing Agricultural and Municipal Wastes, G. E. Inglett, ed., pp. 129–142.

GLOSSARY

Acid hydrolyzable phosphorus . . . Phosphorus that is hydrolyzed by treatment with a mixture of sulfuric and nitric acid and autoclaved.

Aerosolized micro-organisms . . . Microorganisms in very small water droplets suspended in the air.

Anaerobiosis . . . Without air or without oxygen.

Anions . . . Negatively charged ions.

Bicarbonate extractable soil phosphorus . . . That portion of the total soil phosphorus that is extractable with 0.5 molar sodium bicarbonate. This is an index of the phosphorus that plants can extract from calcium carbonate buffered soils.

Cation exchange capacity . . . The sum total of exchangeable cations (positively charged ions) that a soil can absorb.

Clay-size fraction . . . A soil separate consisting of particles less than 0.002 mm in diameter.

Denitrification . . . The biochemical reduction of nitrate or nitrite to gaseous nitrogen either as molecular nitrogen or as an oxide of nitrogen.

Dewpoint . . . The temperature at which the water vapor in a given sample of air becomes saturated.

Dry lye peeling . . . Peeling potatoes with a hot lye solution and removing the peel with brushes and a small volume of rinse water. The peel material is kept separated from the processing plant waste stream.

Electrical conductivity . . . The measurement of a solution's capacity to conduct electricity. In soils and water, the electrical conductivity is a measurement of the total concentration of soluble salts.

Exchangeable sodium percentage . . . The percentage of the cation exchange capacity of a soil that is occupied by sodium.

Flood irrigation . . . Irrigating soils by means of surface application of water in furrows or basins.

Graded fields . . . Fields that have been mechanically smoothed to a particular grade or slope.

Green belt . . . An area of vegetation, either trees, grass, or row crops, surrounding a particular location, for purposes of isolation.

Infiltration failure . . . Failure of a soil that has had satisfactory downward entry of water into the soil to receive water because of sealing of the soil.

Kilometer . . . 1,000 meters, equivalent to 3,280 feet.

Land disposal . . . Disposing of waste materials on land.

Leaching . . . The removal of materials in solution from the soil.

Loading . . . The amount of organic matter, water, and nutrients, applied to land in waste water. *See* Nutrient loading.

Nutrient loading . . . The amount of plant nutrients applied to soil in wastes, either solid or liquid.

Organic phosphorus . . . Phosphorus that is chemically bound to an organic molecule.

Orthophosphate . . . The highest hydrate of phosphoric acid (PO_4^{---}).

Oxygen demand . . . The oxygen required to chemically or biologically oxidize a particular material.

Particle size analyses . . . Determination of the various amounts of the different separates in a soil sample.

Primary treatment . . . The first treatment of waste water, which usually consists of settling or screening out particulate material.

Processing plant waste effluent . . . Waste water discharged from a food processing plant.

Redox potential . . . Oxidation reduction potential in soils or solutions.

Saline . . . A nonsodic (nonsodium) soil containing sufficient soluble salts to impair its productivity.

Secondary treatment . . . Additional treatment of primary treated waste water to remove dissolved organic constituents, usually by biological oxidation.

Sprinkler irrigation . . . Irrigating land by means of a pressurized sprinkling system.

Total Kjeldahl nitrogen (TKN) . . . The nitrogen content of a material that is analyzed by a Kjeldahl method.

Vacuum filtration . . . A process by which settled solids are removed from waste water pumped from the bottom of a primary clarifier (settling basin).

Water table . . . The upper surface of ground water or that level below which the soil is saturated with water.

Wet lye peeling . . . Peeling potatoes with a hot lye solution and removing the peel with high pressure water jets followed by rinsing with a large volume of fresh water. The peel and rinse water are discharged into the processing plant waste effluent.

APPENDIX

TABLE 1.—*Cation exchange capacity (CEC), total Kjeldahl nitrogen (TKN), pH, electrical conductivity, bicarbonate, chloride, exchangeable sodium percent (ESP), organic matter (OM), sodium, potassium, calcium, and magnesium in waste treatment field soils at various depths, and sampling dates*[1]

Treatment fields	Soil depth	TKN (1976)	CEC	pH			EC (1975)	HCO_3 (1975)	Cl (1975)	ESP		OM				Na (1976)	K (1976)	Ca (1976)	Mg (1976)
				1972	1974	1975				1972	1974	1972	1973	1974	1975				
	Cm	*Percent*	*Meq/ 100 g*				*µmhos/ cm*	*Meq/ 100 g*	*Meq/ 100 g*			*Percent*				*Meq/100 g*			
1-F	0-30	0.155	11.7	7.7	7.8	7.3	820	7.12	1.01	15	11	1.80	—	1.22	1.86	6.1	0.8	1.4	0.5
Site 1	30-60	.144	13.1	7.6	8.0	7.4	780	7.83	.77	10	16	1.82	—	1.63	2.01	13.4	1.0	3.4	1.1
	60-90	.079	9.5	7.1	7.2	7.2	1740	3.56	1.37	10	10	1.00	—	.40	.84	9.4	.3	1.4	.6
	90-120	.105	12.6	6.8	5.8	7.1	1560	1.66	2.60	12	7	.77	—	—	.85	9.2	< .1	1.0	.4
	120-160	.131	14.8	6.3	5.6	7.0	2300	2.02	4.92	—	7	—	—	—	.52	8.9	< .1	1.0	.4
1-F	0-30	.125	8.8	8.0	7.6	7.4	690	6.26	.96	17	10	1.46	—	1.20	1.17	3.2	1.6	1.4	.5
Site 2	30-60	.025	8.3	—	7.7	7.5	415	4.56	.67	—	7	—	—	.64	.21	3.0	.5	.9	.4
	60-90	.013	6.9	7.8	8.2	7.5	304	2.90	.67	—	11	.26	—	.12	.14	1.2	< .1	.6	.3
	90-120	.005	3.1	8.0	8.4	7.6	175	2.21	.51	8	7	.02	—	.02	.09	.7	< .1	.2	.1
	120-150	.005	2.4	8.0	8.2	7.7	149	1.43	.55	14	7	.17	—	.03	.05	.8	< .1	.5	.1
2-F	0-30	.111	8.7	7.6	7.0	7.0	660	5.66	.97	2	2	.56	—	1.34	1.31	.5	1.0	1.8	.8
Site 1	30-60	—	4.5	7.8	—	—	—	—	—	6	—	.36	—	—	—	—	—	—	—
	60-90	—	1.8	8.0	—	—	—	—	—	2	—	.09	—	—	—	—	—	—	—
	90-120	—	1.5	8.1	—	—	—	—	—	11	—	.06	—	—	—	—	—	—	—
	120-150	—	1.7	8.1	—	—	—	—	—	12	—	.03	—	—	—	—	—	—	—
2-F	0-30	.060	7.4	8.0	7.7	7.3	400	4.16	.66	4	2	.60	—	.86	.95	.3	1.0	2.7	.6
Site 2	30-60	.042	6.4	8.0	7.9	7.2	405	2.92	.86	6	3	.48	—	.53	.45	.3	.4	2.6	.5
	60-90	.014	6.0	8.2	8.3	7.2	360	3.72	1.00	5	3	.32	—	.33	.62	.2	.3	1.4	.4
	90-120	.007	5.3	—	8.2	7.4	185	3.03	.52	7	4	—	—	.20	.03	.2	.2	1.2	.3
	120-150	.009	5.6	8.2	8.2	—	—	—	—	6	4	.14	—	.10	—	.3	.2	1.4	.3
3-S	0-30	.114	11.3	7.4	7.5	7.3	730	6.94	.85	3	7	—	1.46	1.28	1.97	3.0	1.4	2.1	.6
Site 1	30-60	.017	8.9	7.8	7.6	7.4	520	4.82	.72	4	5	—	.75	.65	.58	1.4	.1	.8	.2
	60-90	.015	7.2	7.8	8.0	7.4	400	3.89	.87	4	5	—	.48	.18	.69	1.5	< .1	.9	.2
	90-120	.036	7.9	8.0	8.1	7.6	200	2.79	.63	6	5	—	.45	.54	.08	2.7	< .1	1.3	.4
	120-150	.018	5.5	7.8	8.2	7.4	380	4.94	.76	10	5	—	.82	.15	.44	1.5	< .1	.9	.2
3-S	0-30	.131	9.5	7.4	7.8	7.6	470	5.32	.74	3	6	—	1.29	1.07	1.37	3.0	1.6	2.3	.8
Site 2	30-60	.034	10.0	7.7	7.8	7.4	350	3.39	.59	4	6	—	.86	.78	.65	2.0	.1	.9	.3
	60-90	.043	8.9	7.8	8.2	7.5	220	2.34	.56	4	9	—	.71	.38	.18	3.0	< .1	1.1	.3
	90-120	.132	8.5	7.8	8.2	7.6	250	2.52	.54	4	9	—	.65	.46	.31	2.8	< .1	.6	.2
	120-150	.038	6.2	7.8	8.3	7.6	320	4.12	.73	4	5	—	.56	.16	.41	3.1	< .1	.5	.1

Treatment fields	Soil depth	TKN (1976)	CEC	pH				ESP			EC (1975)	HCO_3 (1975)	Cl (1975)	OM				Na (1976)	K (1976)	Ca (1976)	Mg (1976)
				1972	1973	1974	1975	1972	1973	1974				1972	1973	1974	1975				
	Cm	*Percent*	*Meq/ 100 g*								*µmhos/ cm*	*Meq/1*	*Meq/1*	*Percent*				*Meq/100 g*			
4-S	0-30	0.126	10	7.8	7.6	7.7	7.4	83	2	1	600	5.62	0.70	1.23	1.16	1.13	1.40	1.0	1.6	1.6	0.7
Site 1	30-60	.032	8	7.8	7.9	7.8	7.4	59	3	3	510	4.21	.81	.74	.93	.22	.74	.6	.9	6.0	.3
	60-90	.001	3	7.9	7.9	8.3	7.5	—	7	4	330	2.17	.56	.38	.11	.05	.08	.2	.5	1.3	.2
	90-120	.001	3	7.9	8.0	8.1	7.6	—	5	4	305	1.68	.65	—	.08	.04	.06	.3	.5	.6	.1
	120-150	.004	3	7.9	8.0	8.3	7.6	8	5	5	250	2.23	.56	.08	.07	.04	.05	.3	.5	.7	.2
4-S	0-30	.101	10	7.7	7.8	7.7	7.5	2	2	5	575	5.60	.81	1.24	1.14	1.10	1.31	.8	1.3	1.4	.6
Site 2	30-60	.034	10	7.9	7.9	8.0	7.5	2	4	3	410	4.27	1.04	.48	.68	.40	.68	.5	.8	1.0	.3
	60-90	.030	9	7.9	7.9	7.6	7.5	2	3	5	355	3.74	.72	.30	.53	.37	.55	.7	.7	1.2	.3
	90-120	.023	5	8.3	7.9	8.0	7.6	—	4	4	200	2.19	.65	.19	.10	.43	.11	.5	.6	1.1	.2
	120-150	.018	5	8.0	—	—	7.6	3	5	6	280	3.89	.73	.18	.14	.05	.14	.7	.5	.8	.2
5-F	0-30	.118	11	—	7.8	7.8	7.5	—	5	3	560	4.70	.70	—	1.60	1.47	1.76	1.0	1.3	2.4	.8
Site 1	30-60	.057	10	7.5	7.6	7.8	7.6	—	2	4	139	3.70	.67	—	1.41	.99	1.07	.9	.7	1.6	.6
	60-90	.108	10	7.7	7.6	7.7	7.6	—	2	5	280	2.63	.72	—	.96	.89	.34	1.7	.3	2.6	.9
	90-120	.041	4	7.7	7.8	8.0	7.6	—	3	7	200	3.07	.12	—	.37	.12	.18	1.0	.2	1.6	.5
	120-150	.024	5	7.7	7.8	8.0	7.6	—	3	3	215	2.90	.60	—	.36	.21	.20	.7	.3	.9	.2
5-F	0-30	.039	5	7.8	7.6	7.5	7.4	—	3	2	645	6.11	.70	—	.42	.65	1.29	.5	1.2	1.6	.5
Site 2	30-60	.067	11	7.6	7.7	7.8	7.4	—	2	2	410	4.29	.84	—	.81	.87	1.47	.7	.4	1.4	.4
	60-90	.072	13	7.8	7.8	7.9	7.5	—	3	2	428	3.49	.67	—	.87	1.17	1.26	1.2	<0.1	1.6	.4
	90-120	.057	13	7.8	7.6	7.8	7.6	2	2	2	390	3.62	1.00	—	1.06	1.06	1.02	.9	<0.1	1.6	.4
	120-150	.055	12	7.8	7.8	7.7	7.6	2	2	2	400	3.61	.86	—	.91	.78	1.17	1.3	.1	1.9	.5

[1] Dashes in columns indicate no data.

TABLE 2.—*Chemical oxygen demand (COD) in potato processing waste water and in water extracted from soil at various depths. Means of 2 sites*[1]

Processing plant	Soil depth	Dates in 1973											Dates in 1974									
		1-31	2-28	4-4	4-27	6-1	6-29	8-3	9-14	10-4	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-8	9-6	10-3
	Cm	*Milligrams per liter*																				
1-F	([2])	1985	1810	1505	1215	—		—	950	1355	1990	1435	2125	2685	2355	1015	1740	—	205	1090	1150	795
	15	400	210	245	—	470		270	160	—	85	65	—	—	115	140	—	—	360	175	195	—
	30	785	485	55	—	110		65	250	295	190	75	575	385	345	205	105	45	—	—	365	—
	60	220	185	120	55	170		125	145	245	180	—	440	385	265	65	220	25	200	210	200	—
	90	110	340	235	235	70		215	205	190	110	135	370	455	540	140	175	35	200	145	170	95
	120	50	110	140	—	45		85	85	160	105	170	410	—	195	460	245	20	—	160	280	165
	150	—	55	50	—	—		45	15	35	35	30	50	95	40	125	150	15	—	100	115	85
					4-27	6-1		8-3	9-14	10-4	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-15	9-6	10-3
2-F	([2])				1265	1075		—	950	730	865	790	700	530	850	1010	850	1035	450	—	813	945
	15				575	10		10	10	15	10	105	—	145	135	385	360	25	20	20	10	10
	30				210	20		10	30	15	25	270	170	—	485	360	305	30	20	30	10	15
	60				25	15		5	5	15	35	320	—	—	470	385	155	20	15	10	10	30
	90				2	10		20	5	10	145	160	15	—	560	480	365	35	15	35	5	10
	120				5	10		2	10	10	5	5	5	20	20	50	0	15	15	15	5	10
	150				35	15		0	20	10	—	1	30	15	20	65	5	10	10	10	5	10

See footnote at end of table.

TABLE 2.—*Chemical oxygen demand (COD) in potato processing waste water and in water extracted from soil at various depths. Means of 2 sites* [1]*—Continued.*

Processing plant	Soil depth	Dates in 1973											Dates in 1974									
										10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-8	9-6	10-3
	Cm	*Milligrams per liter*																				
3-S	(2)									2186	2600	1550	670	2920	4350	7405	3275	—	—	—	1450	1280
	15									240	235	20	—	—	45	50	—	—	95	55	190	—
	30									210	20	20	—	—	50	50	30	45	—	25	50	40
	60									20	15	20	—	—	140	75	—	25	35	45	40	60
	90									260	15	—	—	—	—	—	35	35	25	25	—	110
	120									35	10	20	—	—	50	40	5	20	40	20	55	55
	150									40	20	—	—	—	30	—	—	10	—	—	60	—
					4-27	6-1	6-29	8-3	9-14	10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-15	9-6	10-3
4-S	(2)				1735	1090	1525	1495	1120	1335	1345	1585	1220	1530	1426	1380	900	—	—	1380	1160	1205
	15				80	170	—	30	335	35	30	20	—	—	—	60	40	—	—	75	60	—
	30				45	205	85	—	—	20	—	15	5	—	30	55	20	30	—	75	70	65
	60				40	30	70	50	50	25	—	25	20	—	—	65	15	45	—	70	75	65
	90				45	35	70	30	—	35	—	10	5	—	—	25	10	30	40	40	100	60
	120				—	25	—	50	70	75	—	—	—	—	—	—	—	—	—	—	50	—
	150				—	—	—	—	—	35	—	20	20	—	—	35	—	45	—	25	50	55
		1-31	2-28	4-4	4-27	6-1	6-29	8-3	9-14	10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-15	9-6	10-3
5-F	(2)	1310	2035	1600	1765	1075	1345	—	—	1320	1200	1485	1575	1220	1665	1600	1410	850	—	—	1535	1340
	15	45	35	115	55	—	50	25	40	30	25	140	—	35	265	50	20	45	65	—	15	125
	30	45	35	45	40	195	50	20	35	20	35	85	30	—	105	25	0	—	—	20	35	55
	60	45	40	70	315	345	110	55	45	—	50	45	—	50	45	25	20	15	—	25	10	40
	90	25	25	120	30	230	85	50	35	45	35	35	—	45	55	40	20	30	35	50	65	45
	120	20	35	120	15	170	45	40	10	10	20	15	15	25	15	65	40	55	35	45	35	40
	150	—	25	30	10	170	40	15	20	10	20	25	25	40	35	20	20	30	40	30	30	30

Processing plant	Soil depth	Dates in 1974		Dates in 1975												Dates in 1976						
		11-1	12-12	1-17	2-7	3-7	4-4	5-8		7-28	8-18	9-19										
	Cm	*Milligrams per liter*																				
1-F	(2)	1305	1460	1280	1085	1475	1960	2495		1330	740	—										
	15	125	115	60	—	—	—	165		—	215	100										
	30	170	135	—	—	160	—	80		—	170	—										
	60	75	60	80	20	160	200	—		90	75	55										
	90	90	115	—	—	175	120	120		180	130	—										
	120	200	250	165	—	—	—	230		210	215	—										
	150	110	75	110	—	—	—	120		130	—	—										
		11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3	8-7	9-3	10-3	11-7	12-4	1-8	2-5	3-11	4-8	5-6	5-27	7-8
2-F	(2)	890	865	1004	656	1530	1205	775	970	740	150	450	480	900	935	955	1575	1030	1530	925	1000	1560
	15	10	20	25	—	20	60	15	20	30	25	15	20	25	55	65	—	95	65	25	175	15
	30	10	25	50	15	30	25	10	20	25	25	20	—	35	110	—	—	335	235	65	205	35
	60	10	65	160	20	50	25	15	15	150	20	10	10	260	325	60	—	—	430	165	130	—
	90	10	135	255	90	50	40	20	10	80	20	15	10	350	460	280	655	705	950	465	230	85
	120	5	200	265	20	70	10	15	20	15	15	10	10	235	425	390	45	440	630	155	70	35
	150	10	130	125	105	60	0	15	15	45	10	0	10	120	140	35	120	30	325	35	15	20

		11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3	8-7	10-3	11-7	12-4	1-8	2-5	3-11	4-8	5-6	5-27	7-8
3-S	(2)	1836	1980	2285	1665	1210	1960	2945	3675	1070	—	—	3470	1920	2320	2395	3155	2760	1140	3380	—
	15	60	35	—	—	—	900	45	110	100	—	20	35	40	—	—	—	—	60	75	—
	30	120	40	—	—	—	150	60	65	135	—	95	40	40	—	—	—	60	20	45	—
	60	215	170	—	—	—	1180	80	—	60	45	35	50	30	55	—	—	45	45	40	45
	90	30	70	—	—	—	1300	115	105	85	65	50	35	40	40	—	—	—	45	90	40
	120	60	60	—	—	—	360	60	50	25	25	75	30	40	35	—	—	25	50	20	15
	150	—	—	—	—	—	—	90	—	—	—	—	—	—	—	—	—	—	—	—	60
		11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3											
4-S	(2)	1370	1135	1355	1215	980	1385	1120	835	706											
	15	40	40	—	—	—	45	30	100	—											
	30	40	40	45	30	195	110	35	40	65											
	60	45	40	—	—	40	55	40	35	45											
	90	55	40	45	35	35	45	—	40	25											
	120	—	—	—	—	45	—	—	—	—											
	150	50	40	—	60	—	145	35	40	40											
		11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3											
5-F	(2)	990	1380	1265	410	1360	1635	1550	1300	953											
	15	36	—	—	66	—	160	55	45	50											
	30	30	30	180	25	25	60	25	25	45											
	60	35	25	35	30	25	20	20	25	20											
	90	45	75	50	15	50	60	35	40	85											
	120	45	30	215	45	25	125	56	20	35											
	150	30	25	46	35	15	45	45	45	40											

[1] Dashes in columns indicate no data.

[2] Waste water; depth = 0 ft.

TABLE 3.—*Total Kjeldahl nitrogen (TKN) in potato processing waste water and in water extracted from soil at various depths. Means of 2 sites*[1]

Processing plant	Soil depth	Dates in 1972		Dates in 1973											Dates in 1974							
		11-22	12-21	1-31	2-28	4-4	4-27	6-1		8-3	9-14	10-4	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-8
	Cm	*Milligrams per liter*																				
1-F	(2)	—	60.7	67.6	48.4	48.8	42.2	35.7		—	40.1	44.8	102.1	53.7	65.2	45.3	38.7	64.1	44.7	39.0	—	47.3
	15	—	—	—	—	—	—	.8		10.9	—	—	4.0	—	—	—	6.1	—	—	0	7.0	—
	30	—	—	32.5	—	—	—	—		—	.7	—	5.2	2.8	—	16.0	16.7	12.1	2.7	7.4	—	—
	60	—	—	—	—	—	—	.4		5.0	3.8	—	4.7	—	20.5	21.8	8.8	—	—	—	—	4.4
	90	.7	—	4.8	8.1	—	37.1	.9		6.6	5.5	5.4	4.0	—	16.6	30.2	9.8	—	—	—	22.7	—
	120	—	—	3.3	—	—	—	1.4		—	2.0	—	3.5	—	—	45.0	17.6	20.3	3.0	22.7	—	20.6
	150	—	1.9	1.3	—	1.2	—	.8		1.4	.5	1.1	3.0	2.3	—	4.5	4.3	2.6	—	2.9	2.5	3.2
							4-27	6-1	6-29	8-3	9-14	10-4	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-15
2-F	(2)						44.6	32.7	27.9	—	20.0	30.6	34.6	31.7	25.9	42.6	36.2	51.0	34.1	40.9	15.8	—
	15						2.1	—	—	—	.3	0	3.9	6.2	—	5.7	9.3	11.2	10.6	2.2	1.1	1.6
	30						8.2	19.0	—	.6	—	0	6.5	7.4	—	14.4	15.1	12.2	12.7	2.5	1.1	1.1
	60						2.2	5.1	.7	.7	0	.5	11.2	14.4	17.7	24.8	18.1	14.0	7.4	2.0	.6	.9
	90						.3	5.3	.8	.2	1.1	.8	8.3	—	9.4	23.7	21.8	15.4	18.3	2.7	.9	1.1
	120						11.8	4.1	1.2	.1	.1	.5	7.2	4.9	8.6	12.0	13.4	0.3	11.0	1.6	.6	.8
	150						11.3	1.6	—	.2	.3	.7	10.3	7.3	10.2	10.8	12.2	23.5	18.9	1.5	.9	.7

See footnote at end of table.

TABLE 3.—*Total Kjeldahl nitrogen (TKN) in potato processing waste water and in water extracted from soil at various depths. Means of 2 sites*[1]

Processing plant	Soil depth	Dates in 1972		Dates in 1973											Dates in 1974							
												10-5	11-2	11-30		2-15	3-8		5-3	6-6	7-12	8-15
	Cm	Milligrams per liter																				
3-S	([2])											91.0	38.6	122.1		56.7	134.4		130.5	—	—	—
	15											2.0	9.9	—		—	5.6		—	—	—	8.1
	30											.8	1.3	1.4		—	8.4		—	—	—	2.9
	60											.9	1.5	4.6		—	—		—	—	—	—
	90											.1	1.2	4.3		—	—		—	—	1.2	—
	120											.9	1.4	2.7		—	2.6		.4	—	.7	1.6
	150											—	.4	—		—	—		25.0	1.0	—	—
		11-22	12-21	1-31	2-28	4-4	4-27	6-1	6-29	8-3	9-14	10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-15
4-S	([2])	46.4	52.8	56.4	48.4	55.2	56.2	44.1	52.9	45.0	52.6	46.6	52.1	55.4	50.3	94.0	53.7	56.7	29.4	—	—	47.6
	15	—	—	—	—	—	0	2.4	—	—	13.7	1.3	—	1.0	—	—	—	2.3	—	—	—	—
	30	3.3	—	—	—	—	1.1	—	—	—	—	1.7	—	1.0	1.9	—	3.6	1.1	.1	—	—	1.9
	60	—	—	—	—	—	—	—	—	—	—	1.3	—	1.6	—	—	—	—	.4	—	—	1.6
	90	—	—	—	—	—	.9	—	2.8	.9	—	1.3	—	.4	1.3	—	—	1.7	1.5	—	.6	—
	120	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	150	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.3	—	1.0	—	—
		11-22	12-21	1-31	2-28	4-4	4-27	6-1	6-29	8-3	9-14	10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-15
5-F	([2])	—	71.7	53.5	77.6	58.7	67.0	41.0	48.8	—	—	59.7	40.5	52.7	59.8	60.2	57.4	67.0	21.3	25.4	1.7	—
	15	—	.5	1.1	—	4.4	2.5	—	—	1.1	—	—	3.5	—	—	—	—	—	—	—	—	—
	30	—	.3	1.0	.9	1.2	.9	1.6	2.2	1.1	—	.6	2.6	—	.4	—	1.7	—	.8	—	—	—
	60	0	.8	.5	.4	—	.8	2.3	1.9	.3	—	—	—	—	—	—	—	—	1.0	.6	—	1.1
	90	12.1	—	—	—	—	2.7	.7	8.2	1.5	.7	1.8	3.0	—	—	—	2.0	—	.5	—	—	—
	120	10.8	.7	.5	0	.1	.3	1.6	1.8	1.2	.5	.1	1.7	.1	—	1.2	2.0	—	.2	.4	0	.4
	150	.7	.7	0	1.0	1.2	.3	.6	1.4	.5	.4	1.2	.3	.7	.4	1.4	—	—	.9	.7	.7	.8

Processing plant	Soil depth	Dates in 1974				Dates in 1975												Dates in 1976						
		9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-23	8-18	9-19				1-8		3-9				
	Cm	Milligrams per liter																						
1-F	([2])	38.3	44.3	49.7	50.8	49.7	47.3	60.8	64.2	69.0	64.4	56.4	—	55.7				65.3		82.4				
	15	—	—	—	—	1.1	—	—	—	—	—	—	—	—				—		—				
	30	—	—	—	—	—	—	2.9	—	—	—	—	—	—				—		—				
	60	2.3	—	2.5	—	1.9	—	2.3	—	3.3	—	3.0	2.7	1.9				—		—				
	90	—	—	—	—	—	—	0	—	—	—	—	5.8	—				—		—				
	120	18.1	13.4	11.0	—	.2	—	5.3	—	9.0	—	5.9	9.9	—				—		—				
	150	2.3	2.2	1.8	1.7	—	—	—	—	—	—	—	—	—				—		—				
		9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3	8-7	9-3	10-3	11-7	12-4	1-8	2-5	3-11	4-8	5-6	5-27	7-8
2-F	([2])	20.0	29.3	31.5	34.4	45.0	22.7	57.7	40.9	28.0	42.4	37.7	5.3	15.7	18.8	35.2	49.5	56.7	56.0	53.4	63.8	48.9	41.9	53.8
	15	—	—	.7	—	—	—	—	5.0	—	1.9	—	—	—	.8	.8	3.4	—	—	2.0	13.5	1.7	5.4	3.2
	30	—	—	.4	—	—	7.8	—	6.0	—	2.5	1.6	.5	—	1.1	2.0	—	—	—	—	22.0	—	6.9	—
	60	.2	.8	1.2	—	—	11.3	—	—	—	2.6	2.3	1.1	—	.9	6.3	—	—	—	—	27.9	—	7.4	6.4
	90	—	.8	2.2	4.0	.9	9.8	—	14.7	—	2.0	4.7	.7	—	1.8	7.9	9.3	—	1.1	29.8	35.8	18.3	7.0	6.6
	120	.1	.4	1.1	.2	1.2	4.8	2.2	7.8	.2	1.4	2.0	.6	.7	.7	5.2	2.8	—	—	—	—	—	2.8	1.1
	150	.2	.7	.5	2.3	0	6.1	2.0	6.8	1.0	1.5	1.5	1.2	.2	.4	6.4	.1	—	—	1.8	18.9	1.5	3.9	4.2
		9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3				11-7	12-4	1-8	2-5	3-11	4-8	5-6	5-27	7-8
3-S	([2])	34.7	36.1	78.7	92.8	85.0	149.6	171.1	97.7	113.8	153.5	89.2				185.8	150.8	124.2	126.0	159.7	139.8	72.7	106.6	185.9
	15	—	—	2.5	—	—	—	—	33.4	3.1	—	—				—	—	—	—	—	—	1.9	—	—
	30	—	—	—	—	—	—	—	—	—	—	—				—	—	—	—	—	—	—	—	—
	60	—	—	—	—	—	—	—	—	—	—	—				1.6	—	—	—	—	—	—	—	—
	90	—	—	.9	—	—	—	19.2	—	1.2	—	—				—	—	—	—	—	—	—	—	—
	120	.5	—	—	—	—	—	—	—	—	—	—				1.1	—	—	—	—	—	—	—	—
	150	—	—	—	—	—	—	—	—	—	—	—				—	—	—	—	—	—	—	—	—

		9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3
4-S	(²)	57.8	40.9	46.3	46.1	49.0	48.7	42.5	55.1	51.6	29.0	25.5
	15	1.3	—	.7	—	—	—	—	—	2.9	—	—
	30	1.0	—	.9	—	—	—	—	—	1.4	—	—
	60	.7	—	.9	—	—	—	—	—	—		—
	90	.1	1.1	—	.7	.5	—	—	—	—	.9	1.5
	120	—	—	—	—	—	—	—	—	—	—	—
	150	—	—	—	—	—	—	—	—	—	—	—
		9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3
5-F	(²)	39.3	46.0	39.7	56.6	49.3	44.4	60.8	68.7	58.9	55.1	45.1
	15	—	—	—	—	—	—	—	—	—	—	—
	30	—	—	1.0	.5	4.3	1.3	2.9	2.0	1.5	—	1.3
	60	.3	.7	.5	.4	.1	—	2.3	.8	—	.5	1.4
	90	—	—	—	—	—	—	—	—	—	—	—
	120	.1	.6	.4	.2	—	.2	5.3	1.2	—	.5	.1
	150	.6	.7	.5	.4	.8	1.0	—	1.8	2.6	1.8	2.2

[1] Dashes in columns indicate no data.

[2] Waste water; depth = 0 ft.

TABLE 4.—*Nitrate nitrogen in potato processing waste water and in water extracted from soil at various depths. Means of 2 sites*[1]

Processing plant	Soil depth	Dates in 1972		Dates in 1973										Dates in 1974							
		11-22	12-21	1-31	2-28	4-4	4-27	6-1		8-3	9-14	10-4	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-8
	Cm										*Milligrams per liter*										
1-F	(²)	—	1.5	0.8	0.4	T	0.1	0.1	—	—	0.2	0.2	0	0.2	0.3	0.4	0.1	2.6	3.6	—	0.1
	15	—	—	12.0	—	9.2	—	—		0.3	.3	.6	9.8	—	—	14.0	13.1	—	2.4	3.9	6.2
	30	—	—	25.5	5.0	14.4	—	35.0		7.0	.4	0	9.7	.4	0	.1	10.1	4.7	2.4	.02	—
	60	—	—	.8	15.8	26.5	27.0	21.4		4.0	2.5	1.1	1.8	.4	0	0	2.8	4.0	30.4	—	10.0
	90	32.0	—	21.0	.3	17.5	65.0	5.6		0	.4	2.5	2.1	.2	1.2	0	.1	1.0	20.0	.2	5.6
	120	—	—	5.6	12.5	7.5	9.5	—		4.5	5.1	2.1	.1	.7	.1	.2	.1	.4	1.8	—	.4
	150	—	1.3	.5	.3	.4	3.8	.1		2.5	2.9	4.5	2.2	.8	.7	0	.1	1.6	1.6	.1	.2
							4-4	4-27	6-29	8-3	9-14	10-4	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-15
2-F	(²)						.2	0	0	—	.5	.2	.6	.9	.3	.3	1.1	3.0	2.4	.4	—
	15						11.0	2.2	—	.3	.8	16.8	.1	—	7.5	4.1	.2	8.0	.7	.9	.7
	30						5.1	8.2	—	0	1.5	12.4	—	19	—	0	.1	1.8	3.1	.9	1.0
	60						4.6	9.0	—	.3	4.8	26.7	—	.2	—	0	.2	1.7	11.6	1.2	1.2
	90						.7	.9	—	0	4.0	13.0	—	4.6	—	0	.1	1.8	7.3	.9	1.9
	120						.3	.1	60.6	0	.1	0	—	.8	6.2	1.8	3.0	4.7	2.8	1.3	3.2
	150						.3	3.0	35.0	—	.2	.2	1.8	3.0	6.1	4.8	6.0	14.0	2.8	1.1	1.4
												10-5	11-30	1-11	2-15		4-5	5-8		7-12	8-15
3-S	(²)											.8	2.5	.6	1.2		2.4	4.8		—	—
	15											3.8	58.0	—	—		13.3	—		70.0	110.0
	30											.6	17.5	—	—		20.7	56.0		—	27.0
	60											0	6.0	—	—		8.0	—		140.0	12.1
	90											1.0	.1	—	—		—	9.9		22.5	9.8
	120											1.0	3.7	—	—		4.1	3.8		13.9	2.8
	150											.7	—	—	—		—	—		—	—
		11-22	12-31	1-31	2-28	4-4	4-27	6-1	6-29	8-3	9-14	10-5	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-15
4-S	(²)	1.9	1.9	1.1	.1	1.3	1.3	0	0	1.7	.2	.7	1.0	1.0	.5	.4	.7	3.6	—	—	1.0
	15	—	—	—	—	—	29.7	9.5	46.0	12.0	.1	3.7	10.8	.2	—	—	26.0	3.2	—	—	—
	30	1.5	—	—	—	—	20.8	.1	32.4	—	—	2.8	11.5	8.0	—	11.5	7.8	8.0	2.8	—	71.2
	60	—	—	—	—	—	8.0	3.2	32.4	80.0	54.2	5.8	11.0	11.0	—	—	24.5	21.0	3.2	—	92.8
	90	1.5	—	—	—	—	20.0	—	23.0	20.2	—	15.1	17.0	13.5	—	—	22.0	22.0	10.0	5.8	28.5
	120	—	—	—	—	—	—	—	—	37.0	68.0	18.5	—	—	—	—	—	—	—	—	—
	150	—	—	—	—	—	—	—	—	—	—	31.2	22.0	9.0	—	—	12.	—	16.4	—	6.0

See footnote at end of table.

TABLE 4.—*Nitrate nitrogen in potato processing waste water and in water extracted from soil at various depths. Means of 2 sites*[1]

Processing plant	Soil depth	Dates in 1972		Dates in 1973										Dates in 1974							
		11-22	12-21	1-31	2-28	4-4	4-27	6-1	6-29	8-3	9-14	10-5	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-15
	Cm	*Milligrams per liter*																			
5-F	([2])	—	1.5	.5	.1	T	9.0	—	0	—	—	.1	0	.2	.1	.3	.4	2.6	2.4	.2	—
	15	1.2	3.4	.3	0	.2	.4	—	5.4	1.8	.2	2.5	0	—	1.9	.2	.3	3.4	.2	—	—
	30	—	1.8	.3	.3	.2	.2	—	.2	3.3	1.2	.8	0	1.9	—	.9	1.8	8.6	—	—	.8
	60	1.6	1.5	.1	0	.2	.2	.1	0	.2	.2	—	.5	—	.1	.5	.2	1.8	2.4	—	.1
	90	1.5	2.8	1.6	0	.1	.2	.1	0	.1	1.2	.4	1.4	—	.7	4.0	1.4	2.3	1.3	.1	.4
	120	1.4	1.4	.3	0	—	.4	0	0	1.6	2.4	0	0	.2	1.2	2.6	1.1	2.4	1.2	.2	.1
	150	1.2	—	.1	0	.2	.2	0	0	.2	.2	0	0	.7	.3	0	.4	2.3	2.1	.2	.1

Processing plant	Soil depth	Dates in 1974				Dates in 1975												Dates in 1976						
		9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-23	8-18											
	Cm	*Milligrams per liter*																						
1-F	([2])	0.2	0.7	0.1	0.1	1.6	0.6	1.1	0.1	0	0.2	0.7	0											
	15	.8	—	5.1	4.1	7.5	—	—	—	.3	—	—	.2											
	30	—	—	4.4	.4	—	—	2.0	—	—	—	—	.1											
	60	6.8	—	13.2	0	1.4	3.6	.5	.8	.1	6.0	5.4	1.2											
	90	.2	4.0	2.0	.1	—	—	1.0	2.5	—	—	2.8	.1											
	120	.2	5.4	2.1	.3	1.4	—	.7	1.4	.9	—	0	.1											
	150	6.5	8.1	1.5	.6	2.4	—	—	—	1.5	—	0	—											
		9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3	8-7	9-3	10-3	11-7	12-4	1-8	2-5	3-11	4-8	5-6	5-27	7-8
2-F	([2])	1.1	.2	.2	.3	2.2	.2	.3	.9	.4	.4	0	1.4	0.4	0	1.1	0.2	0.8	1.0	0.7	0.3	0	0.5	0.2
	15	9.8	.3	1.5	.8	6.0	.1	9.8	7.1	9.8	3.0	.1	5.0	2.3	.6	1.1	7.1	7.1	—	.3	0	5.3	.06	.7
	30	.5	6.2	1.7	.8	8.8	4.7	4.8	5.2	19.3	2.5	3.2	3.9	1.9	.2	1.6	7.1	—	—	—	.6	7.0	.05	3.8
	60	.3	27.0	1.9	.2	1.4	2.1	.7	5.9	22.0	2.2	7.5	1.2	5.3	.2	.3	15.0	.1	.2	.7	.3	5.9	.01	.2
	90	8.8	10.3	2.3	.1	1.6	.1	1.0	1.0	11.7	.6	.3	1.7	3.9	.5	.2	3.5	0	.2	.2	.6	1.0	.01	.2
	120	11.2	15.0	1.7	0	1.6	7.0	2.8	1.7	6.0	.6	0	.6	2.6	1.2	.2	4.3	.1	.9	2.7	.1	.1	.01	.2
	150	11.4	7.6	1.3	.1	1.9	.6	6.5	1.8	5.6	4.0	0	1.7	2.5	.6	.1	3.2	3.0	9.5	12.5	1.2	4.2	1.3	.4
		9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3	8-7		10-3	11-7	12-4	1-8	2-5		4-8	5-6	5-27	7-8
3-S	([2])	1.0	.2	.1	.7	2.3	.5	2.1	.8	1.2	1.0	.5	—		—	1.3	.2	.1	.4		1.0	0	.5	.2
	15	.3	—	5.4	2.8	—	—	—	.4	34.9	.4	—	—		—	4.2	10.5	—	—		—	16.6	.06	.7
	30	4.0	7.1	30.1	4.2	—	—	—	.4	44.8	25.0	21.0	—		1.1	4.4	—	—	—		11.9	.6	.05	3.8
	60	4.8	48.0	14.1	7.8	—	—	—	.6	5.4	—	46.3	—		12.5	14.0	10.0	—	—		23.7	—	.02	.2
	90	—	11.8	35.0	16.8	—	—	1.6	.6	8.7	51.0	—	—		73.0	—	6.3	—	—		—	11.4	.02	.2
	120	20.8	37.4	22.5	18.7	—	—	—	.1	4.9	0	1.0	—		7.8	2.9	10.4	—	—		4.2	3.7	.02	.2
	150	17.0	—	—	—	—	—	—	.7	13.9	—	0	10.5		—	—	—	—	—		—	—	1.3	.4
		9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3												
4-S	([2])	.3	.2	.3	.4	1.3	1.5	2.1	.2	.1	1.0	.2												
	15	16.8	—	12.3	23.8	—	—	—	6.1	6.0	5.2	—												
	30	31.4	37.4	7.1	10.0	16.2	5.3	26.5	9.9	14.2	12.7	8.4												
	60	125.0	78.0	12.2	10.5	—	24.1	45.0	11.8	17.1	21.5	20.9												
	90	48.0	82.0	86.0	29.8	7.0	—	65.0	12.7	—	20.4	8.4												
	120	42.0	—	—	—	—	—	—	—	—	—	—												
	150	53.3	56.8	102.0	30.0	—	—	—	1.1	8.2	26.4	18.1												
		9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3												
5-F	([2])	.9	.3	.7	.3	1.3	.5	1.2	.5	.2	.5	.4												
	15	.5	.2	15.6	—	—	.5	—	3.0	4.1	3.8	—												
	30	.6	1.1	22.6	5.8	3.7	3.5	16.6	6.3	6.3	—	.5												
	60	.1	.1	1.1	.1	1.3	.2	1.1	1.0	0	0	2.6												
	90	.7	.6	1.6	0	1.8	.1	2.6	.8	.9	1.1	.9												
	120	.2	.4	2.1	.8	1.5	1.6	1.8	1.5	.2	0	0												
	150	.1	.1	.9	.2	1.5	1.9	1.9	1.5	.6	0	0												

[1] Dashes in columns indicate no data.

[2] Waste water; depth = 0 ft.

TABLE 5.—*Total phosphorus in potato processing waste water and in water extracted from soil at various depths. Means of 2 sites*[1]

Processing plant	Soil depth	Dates in 1972		Dates in 1973											Dates in 1974						
		11-17	12-21	1-31	2-28	4-4	4-27	6-1		8-3	9-11	10-4	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12
	Cm	*Parts per million*																			
1-F	(2)	—	10.60	12.82	13.11	10.64	8.00	6.66		—	10.44	10.44	30.72	10.68	16.04	17.52	16.92	14.30	17.74	17.61	—
	15	.82	3.67	1.99	2.92	.03	—	—		0.76	8.62	.86	5.05	7.84	—	—	4.88	2.10	—	.80	4.39
	30	3.61	1.28	2.95	2.45	3.49	—	3.52		3.36	6.78	7.82	8.42	8.30	3.10	6.16	7.49	4.65	2.47	1.88	—
	60	.19	3.45	6.43	3.79	2.61	2.96	4.46		4.35	4.50	4.29	4.92	—	3.48	2.61	7.53	6.02	—	.67	.61
	90	.42	1.00	1.46	2.16	2.53	.88	3.43		1.51	.80	.24	5.84	—	3.23	.68	5.41	5.01	—	1.94	.74
	120	.07	.88	1.88	1.67	.04	2.66	1.07		.30	3.26	3.12	3.59	.11	.73	—	3.59	3.73	5.00	4.79	1.60
	150	1.74	.02	1.11	.22	.88	2.52	1.36		1.46	2.57	2.67	3.59	2.03	.52	1.87	1.80	1.93	2.34	1.49	.08
							4-27	6-1	6-29	8-3	9-14	10-4	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12
2-F	(2)						8.28	8.56	5.0	—	2.53	7.44	6.56	6.28	5.60	4.80	6.23	8.20	8.06	3.68	1.54
	15						.63	.68	.04	.03	.37	.05	.32	.98	—	.84	1.28	1.94	1.92	.85	.63
	30						.27	.52	.34	.16	.03	.12	.53	1.54	1.72	1.71	1.75	1.60	2.10	.88	.76
	60						.35	.03	.02	.22	.03	.12	.76	1.15	2.37	3.20	5.47	2.25	1.49	.95	.81
	90						.09	.06	.00	.44	.09	.17	.73	1.11	2.53	3.48	3.01	3.14	2.91	1.49	.66
	120						.32	.32	.01	.03	.02	.02	.97	.38	2.31	1.34	1.94	1.87	2.05	.48	.48
	150						.37	.55	.06	.09	.15	.09	1.16	.54	2.07	1.50	2.19	1.53	1.77	.39	.33
												10-5	11-2	11-30	1-11	2-15	3-7	4-5	5-3	6-6	7-12
3-S	(2)											18.06	20.92	18.48	39.16	66.24	21.66	64.00	18.20	—	6.70
	15											.27	1.20	.87	—	—	1.30	.81	—	—	—
	30											.23	.14	.33	—	—	—	.54	1.29	.68	—
	60											.29	.49	1.69	—	—	2.63	.67	.32	.03	.09
	90											.36	.13	.13	—	—	—	—	.68	1.18	.79
	120											.05	.05	.13	—	—	.06	.62	.21	1.06	.95
	150											.09	.04	—	—	—	—	—	—	.03	—
		11-22		2-1	2-28	4-4	4-27	6-1	6-29	8-3	9-14	10-5	11-2	11-30	1-11	2-15	3-8	5-4	5-3	6-6	7-12
4-S	(2)	—		8.76	8.03	6.44	8.12	5.32	8.16	10.44	2.08	9.17	8.96	8.92	7.44	8.48	9.54	7.57	5.85	6.74	—
	15	—		—	—	—	.25	1.71	—	2.53	4.78	1.19	1.23	2.20	.95	—	2.06	.73	.97	—	—
	30	.43		—	—	.44	4.69	.52	.18	—	—	.71	—	2.01	3.63	—	4.84	1.48	3.30	3.60	—
	60	—		.18	—	.74	—	.87	.07	.22	.62	.03	—	.19	.78	—	.70	.06	.65	1.44	2.18
	90	.46		—	—	—	.92	.90	.06	.90	—	.08	—	.05	.30	—	2.37	—	.65	.28	.28
	120	—		—	—	—	—	.06	—	—	2.68	.15	—	—	—	—	.98	.27	1.30	—	—
	150	—		—	—	—	—	—	—	—	—	.22	—	.16	.26	—	—	.08	—	—	.66
		11-22	12-21	1-31	2-28	4-4	4-27	6-1	6-29	8-3	9-14	10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12
5-F	(2)	—	—	8.44	13.65	9.16	10.96	7.68	8.32	—	—	9.36	6.20	9.72	9.96	6.44	9.03	8.73	10.7	4.78	—
	15	1.86	.03	.04	.80	.19	.15	—	.18	.13	.02	.03	.05	.24	—	.30	.06	.40	—	.86	.50
	30	.22	.09	.05	.04	.26	.04	.26	.02	.01	.02	.12	.02	.03	.11	—	.03	.02	.05	—	—
	60	.01	.03	.02	.05	.05	.07	.15	.06	.08	.02	—	.09	—	—	.13	.06	.08	.05	.04	—
	90	1.21	.88	.85	.13	.20	.47	4.05	.17	1.19	.44	.75	.21	.19	—	.09	.10	.02	.79	1.29	.12
	120	.38	.11	.06	.09	.03	.01	.01	.04	.06	.05	.03	.03	.02	.15	.15	.02	.08	.19	.04	.06
	150	.32	.02	.13	.03	.03	.02	.03	.03	.03	.02	.02	.18	.47	.04	.03	.02	.03	.02	.05	.05

Processing plant	Soil depth	Dates in 1974					Dates in 1975										Dates in 1976	
		8-8	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-23	8-18	9-19	10-3	3-11	7-8
	Cm	*Parts per million*																
1-F	(2)	6.36	11.06	12.00	14.96	9.33	11.75	13.32	10.16	12.19	14.09	14.22	12.31	7.19	10.63	—	14.62	7.75
	15	—	3.27	—	11.86	—	14.85	—	—	—	5.33	—	—	11.98	—	4.87	—	—
	30	6.42	2.42	—	8.38	11.88	—	1.73	5.78	—	—	—	—	7.65	—	5.50	—	—
	60	3.45	2.21	—	5.71	4.85	5.00	1.02	3.19	10.31	5.66	1.62	3.63	3.07	3.12	3.15	—	—
	90	2.36	1.27	—	—	—	—	—	9.00	10.25	4.50	—	—	7.87	—	3.66	—	—
	120	4.79	1.90	4.00	8.08	.87	4.47	—	.12	.26	.74	—	5.32	.93	—	2.42	—	—
	150	1.61	1.45	1.17	.24	.14	.97	—	—	—	.11	.75	.11	—	—	1.63	—	—

See footnote at end of table.

TABLE 5.—*Total phosphorus in potato processing waste and in water extracted from soil at various depths. Means of 2 sites —Continued*

Processing plant	Soil depth	Dates in 1974					Dates in 1975												Dates in 1976			
		8-15	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3	8-7	9-3	10-3	11-7	12-4	3-11	4-8	5-6	7-8
	Cm	*Parts per million*																				
2-F	(2)	—	3.85	7.35	4.98	3.36	9.57	6.93	5.89	7.75	5.69	7.66	7.16	1.00	2.16	3.75	7.22	—	10.29	12.50	8.38	7.65
	15	.52	.13	.08	.25	.19	1.05	—	.58	.57	.80	.76	.12	.77	.71	.45	0.58	0.64	.75	2.11	.12	1.57
	30	.59	.16	.58	.43	.32	.33	6.61	1.78	1.31	1.09	1.23	.72	.74	.35	.39	.36	1.01	—	1.99	1.94	1.44
	60	.58	.58	.46	.49	.15	.42	2.91	.71	1.22	1.08	1.20	1.24	.95	.70	.35	1.44	.89	—	2.74	4.59	3.91
	90	.54	.36	.26	.55	.31	.69	1.68	.84	1.05	.78	1.27	2.50	.82	.69	.48	1.49	1.26	1.62	4.96	4.63	4.66
	120	.36	.05	.26	.43	.25	.38	1.29	1.36	2.03	.03	1.69	.35	.75	.61	.45	.96	1.07	—	—	.18	.40
	150	.18	.17	.17	.18	.35	.18	1.35	.03	.59	.05	1.33	1.42	.43	.59	.89	.87	.87	.08	.11	.09	3.44
		8-15	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3	8-7	9-3	10-3	11-7		3-11	4-8	5-6	7-8
3-S	(2)	—	10.60	10.64	18.20	6.36	6.99	9.60	23.75	—	18.75	20.62	15.00	—	—	—	—		22.50	20.00	8.38	13.25
	15	.64	.53	—	.81	—	—	—	—	1.31	1.21	1.66	—	—	—	—	2.00		—	—	.29	—
	30	.73	.75	—	1.40	.42	—	—	—	2.05	1.53	1.56	2.44	—	.79	.31	1.39		—	1.75	—	—
	60	.76	1.09	.30	2.36	—	—	—	—	2.12	1.34	—	1.50	—	1.18	—	.88		—	—	—	1.06
	90	1.30	—	—	.54	1.48	—	—	2.59	3.87	4.00	1.28	—	—	.99	—	—		—	—	—	—
	120	.09	.06	.56	.02	—	—	—	—	.70	.81	.62	.41	2.36	1.18	1.72	.30		—	.12	.09	.06
	150	—	2.03	—	—	—	—	—	—	2.12	.91	1.12	.83	1.31	.91	1.00	—		—	—	—	—
		8-15	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3		9-3							
4-S	(2)	8.24	6.97	10.30	9.46	6.35	11.34	10.36	7.12	8.25	7.44	3.62	6.94		—							
	15	1.66	2.40	—	1.01	2.60	—	—	—	2.66	3.76	3.06	—		2.13							
	30	.81	6.52	2.58	2.55	.67	—	.23	—	5.50	3.26	3.72	2.81		1.89							
	60	1.91	2.95	2.09	1.34	—	—	—	—	1.82	1.51	1.67	1.59		1.19							
	90	.05	.04	.60	.09	.06	.13	.06	1.57	.16	—	.74	.03		1.02							
	120	—	—	—	—	—	—	—	—	—	—	—	—		1.25							
	150	.12	.02	.02	—	—	—	—	—	.28	.44	.24	.18		.16							
		8-15	9-6	10-3	11-1	12-12	1-17	2-7	3-4	4-4	5-8	6-6	7-3			10-8						
5-F	(2)	—	8.33	11.16	6.12	8.01	7.57	9.77	12.03	15.62	7.81	15.60	12.19			9.51						
	15	.29	.09	.25	.18	—	—	.53	.60	1.17	1.81	.44	—			.38						
	30	.05	.08	.35	.09	.08	.65	.18	.94	.20	.08	.12	.23			.23						
	60	.09	.05	.57	.18	.04	.04	.08	.05	.72	.05	.11	.09			.12						
	90	.39	.67	.15	.08	—	.15	.23	.25	1.32	.23	.27	2.19			.67						
	120	1.67	1.16	1.20	.42	.19	.43	.06	3.11	3.58	4.18	.08	.05			1.09						
	150	.03	.28	.05	.04	.02	.03	.05	.03	.06	.45	.04	.09			.03						

[1] Dashes in columns indicate no data.
[2] Waste water; depth = 0 ft.

TABLE 6.—*Potassium in potato processing waste water and in water extracted from soil at various depths. Means of 2 sites*[1]

Processing plant	Soil depth	Dates in 1972		Dates in 1973										Dates in 1974									
		11-17	12-21	1-31	2-28	4-4	4-27	6-1	8-3	9-14	10-4	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-8	9-6	10-3
	Cm	*Milliequivalents per liter*																					
1-F	(2)	—	2.7	—	3.2	3.1	2.8	2.0	—	2.6	2.6	3.5	3.4	3.9	5.4	5.2	4.2	2.5	5.9	—	3.3	3.1	—
	15	0.9	2.9	1.3	1.2	.7	0	—	.9	2.5	.8	1.2	1.7	—	—	1.2	2.3	—	.9	3.4	—	3.0	—
	30	—	1.8	1.9	1.7	1.5	—	2.3	1.8	1.7	1.3	1.4	1.6	1.9	2.5	2.3	1.6	.5	3.2	2.1	6.2	2.3	—
	60	.2	1.2	1.3	.2	.8	.7	1.0	4.3	.5	1.0	.9	—	1.4	1.5	1.5	—	—	3.4	—	—	3.0	—
	90	.1	.6	.2	.7	.8	.6	.4	.9	.8	.8	1.0	—	1.9	3.3	2.5	2.4	—	3.0	—	2.8	1.9	—
	120	.05	.6	.3	.3	.3	—	.3	.4	.2	.2	.2	.2	1.8	—	.8	1.8	2.1	3.6	.9	3.5	1.8	1.6
	150	.12	1.0	.2	.1	.1	—	.1	.4	.8	.8	.6	.7	.2	.7	.6	.2	.2	1.2	.2	.8	.3	.2

							4-27	6-1	6-29	8-3	9-14	10-4	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-15	9-6	10-3
2-F	(2)						3.1	1.7	1.9	—	1.3	1.9	1.8	2.1	1.9	3.0	2.5	2.9	2.1	4.7	1.0	—	1.6	2.3
	15						.2	.1	.1	.3	.3	.4	.8	1.2	—	.9	1.4	1.3	2.2	1.4	.5	.3	.3	.3
	30						1.3	.5	—	.4	.2	.4	1.2	1.3	1.9	2.1	1.9	2.1	2.3	1.3	.5	.3	—	.4
	60						.3	.1	.1	.3	.1	.4	1.5	2.1	2.0	2.6	2.2	2.3	—	1.4	.4	.3	.4	.4
	90						.1	.1	.1	.2	.4	.4	1.5	2.0	2.3	2.6	2.4	2.5	2.4	1.4	.3	.3	.4	.4
	120						1.3	.2	.1	.3	.1	.1	.9	1.1	1.2	1.4	1.4	2.8	1.5	1.6	.2	—	.3	.5
	150						1.3	.1	.1	.6	.1	.1	1.6	1.1	1.2	1.4	1.3	1.4	1.5	1.3	.3	.2	.2	.3
												10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-15	9-6	10-3
3-S	(2)											4.8	5.9	6.7	.6	4.1	7.0	4.1	6.8	—	—	—	3.0	2.5
	15											.6	.9	1.1	—	—	.7	1.0	—	—	—	3.2	2.0	—
	30											.3	.2	.6	—	—	1.0	.8	.1	3.7	—	.7	.8	—
	60											.1	0	—	—	—	2.7	1.1	—	.2	.1	.1	.6	1.8
	90											0	0	.6	—	—	—	—	.4	.7	.4	.4	—	—
	120											0	0	.4	—	—	.5	.5	.1	2.7	.4	.1	.1	.9
	150											.1	0	—	—	—	—	—	—	.1	—	—	.7	—
		11-22		1-31	2-28	4-4	4-27	6-1	6-29	8-3	9-14	10-5	11-2	11-30	1-11	2-14	3-8	4-5	5-3	6-6	7-12	8-15	9-6	10-3
4-S	(2)	—		3.2	3.0	3.6	1.7	3.4	3.6	4.0	3.5	3.3	3.6	4.1	3.4	4.1	3.3	3.4	2.2	—	—	3.4	3.1	3.4
	15	—		—	—	3.8	—	3.3	—	4.5	4.8	2.6	1.7	3.1	—	—	—	3.1	3.6	—	—	5.5	4.5	—
	30	—		—	—	—	—	2.7	—	—	—	3.0	—	3.0	3.5	—	4.6	3.0	3.8	7.4	—	6.7	4.2	3.8
	60	—		—	—	—	.3	1.8	.2	.2	.4	.1	—	2.0	2.3	—	—	2.6	—	6.8	—	6.5	6.7	5.7
	90	.1		—	—	1.0	.1	1.8	.1	.8	—	.1	—	1.8	.9	—	—	1.4	2.7	6.3	2.8	3.7	6.0	6.0
	120	—		—	—	—	—	—	—	1.9	3.9	.1	—	—	—	—	—	—	—	—	—	—	4.6	—
	150	—		—	—	—	—	.1	—	—	—	.5	—	1.3	.1	—	—	.1	—	3.4	—	.2	2.4	.2
		11-22	12-21	1-31	2-28	4-4	4-27	6-1	6-29	8-3	9-14	10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-15	9-6	10-3
5-F	(2)	—	—	3.0	5.4	4.1	4.2	2.8	3.7	—	—	4.0	3.2	3.3	4.0	3.0	3.6	3.9	3.5	3.9	—	—	4.0	3.9
	15	—	—	2.4	2.3	2.0	3.0	—	.4	3.6	4.9	3.0	3.4	3.1	—	2.2	2.9	2.9	—	2.7	—	—	2.8	4.0
	30	.5	.6	.9	.9	1.1	1.1	1.6	1.7	1.6	.4	2.0	1.5	.5	1.9	—	3.1	2.2	3.7	—	—	3.4	3.2	2.9
	60	.6	.4	.1	.2	.5	.3	.6	.4	.3	.3	—	.3	.4	—	.5	—	.2	.3	.2	—	.3	.3	.4
	90	.3	.5	—	.1	.1	.2	.2	1.1	.8	.5	.4	.4	.5	—	.4	.5	.5	.2	.6	.3	.8	.6	.5
	120	.2	.4	—	.1	.1	.3	.4	.5	.7	—	.4	.3	.3	.2	.2	.2	1.0	.2	1.6	.5	1.0	1.0	.9
	150	.3	.3	.2	.2	.2	.2	.4	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.4	.2	.2	.2	.2	.6

Processing plant	Soil depth	Dates in 1974		Dates in 1975												Dates in 1976			
		11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-23	8-18	9-19				3-11			7-8
	Cm	*Milliequivalents per liter*																	
1-F	(2)	4.4	4.1	4.0	3.5	4.4	—	2.0	3.6	3.8	1.6	3.5				5.7			3.7
	15	2.6	1.2	2.7	—	2.5	—	2.0	—	—	3.7	—				—			—
	30	2.6	2.0	—	—	1.7	1.5	—	—	3.2	2.8	—				—			—
	60	2.7	1.7	1.6	1.5	2.6	2.1	1.7	2.7	2.9	2.9	2.7				—			—
	90	1.8	—	—	—	1.5	—	1.6	—	—	2.1	—				—			—
	120	1.4	1.2	1.2	—	1.2	1.2	1.1	—	1.0	1.0	—				—			—
	150	.2	.2	.4	—	—	—	.4	.2	—	—	—				—			—
		11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3	8-7	9-3	10-3	11-7	12-4	4-8	5-6	5-27	7-8
2-F	(2)	2.8	2.7	3.9	1.7	3.7	2.7	2.0	2.8	2.7	.2	1.0	1.4	2.4	—	2.7	3.5	2.5	2.2
	15	.3	.7	—	—	1.3	1.3	.8	.7	.6	.8	.6	.5	1.4	1.0	1.6	2.0	1.0	1.1
	30	.4	1.2	1.2	1.3	2.3	1.7	1.9	.8	—	.8	.5	.6	1.2	1.4	—	2.5	1.6	1.0
	60	.5	1.6	1.8	1.5	1.4	2.0	2.2	1.3	1.8	.7	.5	.5	2.2	1.1	2.7	2.2	2.2	1.0
	90	.5	1.3	1.7	1.3	3.2	1.9	1.9	.8	1.3	.6	.3	.5	1.9	1.6	3.0	3.1	2.1	1.2
	120	.6	1.2	.3	1.1	1.6	1.5	.5	.7	1.1	.6	.5	.6	1.6	1.4	—	1.5	1.0	.7
	150	.4	.9	.4	1.1	.4	1.5	.4	.8	1.3	.7	.6	.6	1.5	.8	.7	2.0	.5	1.0
		11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3			10-3	11-7		4-8	5-6	5-27	7-8
3-S	(2)	5.0	—	3.7	7.8	8.5	—	6.0	7.5	4.8			—	6.5		1.4	1.3	.7	1.2
	15	2.8	2.1	—	—	—	3.4	4.5	7.2	—			—	—		—	—	.6	—
	30	2.6	2.1	—	—	—	2.5	4.1	3.9	4.7			.4	3.7		—	.4	.4	—
	60	1.7	1.4	—	—	—	4.1	1.4	—	—			—	—		—	.2	—	.3
	90	1.5	1.6	—	—	2.0	5.1	3.4	4.2	—			—	—		—	—	—	—
	120	.4	1.0	—	—	—	—	.8	.5	.3			.6	—		—	.05	.01	.05
	150	—	—	—	—	—	7.2	2.8	—	—			—	—		—	—	—	—

See footnote at end of table.

TABLE 6.—*Potassium in potato processing waste water and in water extracted from soil at various depths. Means of 2 sites —Continued*

Processing plant	Soil depth	Dates in 1974		Dates in 1975						
		11-1	12-2	1-17	2-7		4-4	5-8	6-6	7-28
	Cm	Milliequivalents per liter								
4-S	(²)	.2	3.2	.6	.5		3.5	3.2	1.7	2.4
	15	4.2	3.3	—	—		3.1	3.0	4.1	—
	30	4.2	3.4	3.3	4.4		2.7	2.7	3.7	—
	60	3.8	3.1	—	—		3.6	3.5	3.8	3.7
	90	4.9	3.1	2.8	3.6		3.7	—	3.7	3.4
	120	—	—	—	—		3.4	—	—	—
	150	.3	.1	—	—		2.6	—	.3	.4
		11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3
5-F	(²)	3.4	3.9	2.7	3.7	3.7	4.6	4.1	3.1	3.0
	15	3.5	—	—	—	—	2.6	3.0	2.2	—
	30	2.8	1.2	2.1	1.3	2.0	2.0	2.2	.2	1.5
	60	.4	.4	.4	.4	.4	.4	.5	3.7	2.0
	90	.5	—	.2	—	.7	—	—	.7	1.2
	120	.9	.7	1.7	.2	1.0	1.3	1.3	.4	.7
	150	.2	.3	.2	.2	.1	.2	.3	.2	.2

[1] Dashes in columns indicate no data.

[2] Waste water; depth = 0 ft.

TABLE 7.—*Calcium in potato processing waste water and in water extracted from soil at various depths. Means of 2 sites*[1]

Processing plant	Soil depth	Dates in 1972		Dates in 1973											Dates in 1974								
		11-17	12-21	2-1	2-28	4-4	5-1	5-31		8-3	9-14	10-4	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-8	9-6
	Cm	Milliequivalents per liter																					
1-F	(²)		3.0	1.9	2.9	2.2	2.1	4.3		—	1.1	1.0	1.0	1.2	1.4	1.6	2.5	1.8	1.8	2.8	—	2.3	1.8
	15	28.3	19.9	10.0	3.8	11.5	—	—		28.7	2.5	1.2	2.3	2.3	—	—	5.6	—	—	5.9	9.2	—	5.6
	30	20.8	42.5	16.2	15.1	3.3	—	21.5		3.2	3.8	4.2	2.9	3.1	4.4	5.6	5.8	4.0	6.3	4.3	—	4.2	5.3
	60	3.0	17.7	1.7	15.3	9.8	13.1	15.8		11.1	7.6	10.5	8.1	—	7.3	6.3	5.4	—	2.0	5.5	—	—	2.7
	90	10.3	18.7	13.1	10.0	17.9	30.6	10.9		6.8	5.7	7.1	4.3	—	6.4	2.2	2.9	4.1	2.0	5.1	—	1.6	5.4
	120	1.3	5.6	12.2	27.2	—	—	—		6.4	4.6	5.2	3.1	5.6	5.5	—	6.4	7.1	7.4	4.6	6.9	4.1	7.7
	150	.2	2.2	4.2	—	2.0	—	2.9		1.5	2.3	2.3	3.1	3.0	8.9	6.1	5.7	9.7	5.9	4.5	—	1.0	6.8
							4-27	6-1	6-29	8-3	9-14	10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-15	9-6
2-F	(²)						5.5	4.2	4.0	—	1.9	1.9	1.9	2.0	2.1	3.4	4.1	3.4	2.9	3.4	3.5	—	3.5
	15						4.7	5.4	5.7	2.6	2.3	2.6	2.7	2.7	—	4.2	5.2	5.1	5.5	2.8	2.9	3.2	3.8
	30						6.9	6.3	—	2.3	1.4	2.2	2.7	3.0	3.5	7.4	6.3	6.3	6.2	2.8	2.6	2.0	—
	60						7.6	10.7	3.7	3.2	1.9	4.3	2.0	2.4	2.4	4.6	5.6	5.6	5.6	4.2	3.7	2.8	5.5
	90						4.6	4.3	5.9	4.2	2.9	3.4	2.2	2.8	3.0	5.5	4.8	6.0	5.4	3.6	2.6	3.8	5.6
	120						4.1	4.4	7.1	3.9	2.0	4.0	3.4	3.4	3.6	5.0	7.9	5.5	6.8	5.4	4.4	—	7.7
	150						5.4	—	4.0	—	—	3.5	2.5	3.6	3.8	5.0	6.2	7.1	7.6	5.2	4.4	4.8	4.2
												10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-15	9-6
3-S	(²)											1.1	1.0	1.1	.6	2.6	2.7	2.6	2.8	—	—	—	1.9
	15											3.5	4.4	3.0	—	—	3.7	4.5	—	—	—	12.0	—
	30											4.5	1.5	2.7	—	—	2.2	6.7	6.8	3.8	—	5.9	3.5
	60											5.7	5.2	—	—	—	3.7	1.0	—	8.7	14.9	2.4	3.8
	90											6.1	2.3	7.4	—	—	5.6	—	5.1	8.0	5.2	.7	—
	120											3.8	4.5	3.0	—	—	—	4.2	14.8	6.3	7.3	1.8	2.0
	150											2.2	.8	—	—	—	—	—	—	4.3	—	—	5.1

		11-22				4-4	4-27	6-1	6-29	8-3	9-14	10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-15	9-6
4-S	(2)	—				3.4	2.1	2.2	2.2	2.4	2.0	2.0	1.7	2.3	2.0	3.4	3.4	3.5	3.7	—	—	3.1	3.6
	15	—				—	3.9	2.1	—	4.5	4.6	2.6	3.6	2.9	—	—	—	5.1	5.6	—	—	4.1	6.0
	30	6.7				—	—	3.6	—	—	—	4.3	—	3.2	3.0	—	4.6	5.3	7.0	6.0	—	17.4	7.2
	60	—				—	—	3.1	3.0	5.6	6.7	4.2	—	3.7	4.7	—	—	3.0	7.4	4.5	—	15.6	18.6
	90	5.9				1.2	2.8	3.3	5.8	4.7	—	5.2	—	3.5	3.8	—	—	6.1	9.1	7.6	5.6	6.6	19.5
	120	—				—	—	—	—	—	5.1	4.2	—	—	—	—	—	—	—	—	—	—	—
	150	—				—	—	—	—	—	—	5.0	—	3.4	—	—	—	4.9	—	5.8	—	1.6	1.7
		11-22	12-21	1-31	2-28	4-4	4-27	6-1	6-29	8-3	9-14	10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-15	9-6
5-F	(2)	—	—	3.4	3.5	2.1	1.7	1.6	1.9	1.7	—	1.8	2.2	1.9	2.2	3.0	3.2	2.8	3.0	2.7	1.5	—	3.1
	15	5.3	7.5	4.0	4.6	1.1	1.1	—	1.6	1.5	.6	.8	1.8	1.7	—	2.1	2.5	—	1.5	4.2	—	—	1.6
	30	6.1	9.4	4.9	3.8	2.1	1.9	3.2	1.7	2.3	2.6	1.5	2.0	2.3	2.8	—	.9	2.9	4.6	—	—	1.3	.8
	60	5.7	12.0	5.4	3.5	2.0	4.5	3.4	3.5	3.2	1.6	—	1.9	—	3.1	1.7	—	6.8	5.4	3.7	—	2.8	3.1
	90	8.0	13.2	10.7	4.8	1.6	5.0	2.0	7.2	4.2	2.5	4.0	3.9	2.5	—	3.3	4.1	4.9	4.8	6.3	12.7	4.7	4.2
	120	9.4	10.1	5.1	9.1	3.8	5.2	2.8	6.4	2.7	5.6	7.2	5.3	6.0	6.7	10.7	8.2	6.9	7.9	6.8	10.2	5.1	7.2
	150	11.7	13.5	4.4	4.6	2.1	3.0	2.4	4.7	3.4	4.7	5.6	5.7	6.4	7.2	3.9	7.5	11.7	9.1	10.2	12.0	4.9	6.7

Processing plant	Soil depth	Dates in 1974			Dates in 1975												Dates in 1976				
		10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-23	8-18	9-19								
	Cm	*Milliequivalents per liter*																			
1-F	(2)	—	1.4	1.8	2.1	—	2.1	—	3.9	2.4	2.2	2.0	2.0								
	15	—	3.1	3.6	3.1	—	—	—	2.9	—	—	2.5	—								
	30	—	3.3	3.4	—	—	2.8	—	—	—	—	2.5	—								
	60	—	4.5	3.4	4.2	3.8	3.6	3.5	3.6	4.6	4.8	4.2	4.7								
	90	—	1.5	—	9.1	—	3.0	3.5	2.2	—	—	2.3	—								
	120	1.9	1.0	3.0	2.3	—	6.3	4.4	6.6	—	6.0	.8	—								
	150	1.9	4.5	1.9	—	—	—	—	1.6	—	—	—	—								
		10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3	8-7	9-8	10-3	11-7	12-4	3-11	4-8	5-6	5-27	7-8
2-F	(2)	3.4	3.6	4.0	3.4	3.8	5.6	2.0	3.6	3.4	3.0	3.3	3.4	3.8	3.6	—	3.3	3.0	3.1	2.9	4.1
	15	2.2	2.3	2.7	—	—	4.9	5.3	3.1	3.6	—	2.0	—	3.1	4.8	5.0	3.1	3.9	1.9	3.2	5.4
	30	3.9	2.4	3.9	6.2	3.8	5.5	5.2	—	4.0	—	—	—	2.7	4.9	—	—	3.6	4.7	3.2	5.1
	60	5.1	3.9	3.5	4.0	3.2	—	6.5	4.4	4.3	3.6	—	4.4	3.0	4.6	2.1	2.7	2.9	3.3	3.7	4.4
	90	4.4	2.7	5.3	5.4	3.3	—	4.0	3.0	3.6	3.8	3.0	4.0	2.7	4.7	5.7	2.8	4.1	3.7	3.5	4.2
	120	4.0	3.5	5.1	6.5	5.6	5.4	5.7	7.4	5.8	4.8	2.6	4.4	3.8	4.2	5.8	—	1.0	1.3	3.8	.9
	150	2.2	3.6	4.5	4.3	4.2	6.8	6.5	6.5	5.8	4.5	2.8	1.9	3.8	3.7	4.1	2.3	4.0	1.8	3.6	3.2
		10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3							4-8	5-6	5-27	7-8
3-S	(2)	2.6	2.6	—	3.4	2.5	2.5	—	2.4	2.0	2.0							2.5	3.7	—	—
	15	—	2.9	.8	—	—	—	4.8	8.9	1.7	—							2.8	2.1	—	—
	30	—	2.8	1.3	—	—	—	2.2	5.4	7.2	8.0							—	—	4.5	—
	60	2.6	2.2	1.2	—	—	—	2.8	1.6	—	—							—	—	—	1.7
	90	—	3.0	2.3	—	—	2.1	2.3	6.1	6.3	—							.5	.6	.9	4.9
	120	2.7	1.2	2.9	—	—	—	—	1.3	6.7	.6							—	—	—	2.2
	150	—	—	—	—	—	—	7.0	—	—	—										
		10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-5	7-3										
4-S	(2)	3.4	2.3	5.9	2.2	3.6	3.7	6.3	3.3	3.7	3.6										
	15	—	5.7	3.5	—	—	—	4.0	—	5.1	—										
	30	7.8	4.9	2.0	5.6	1.5	—	—	4.2	5.4	—										
	60	13.7	3.5	3.9	—	—	—	—	3.0	6.7	—										
	90	14.9	8.7	2.2	2.2	1.3	—	2.8	—	7.7	2.4										
	120	—	—	—	—	—	—	—	—	—	—										
	150	4.4	11.4	10.3	—	—	—	3.3	—	3.5	4.1										
		10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-5	7-3										
5-F	(2)	3.5	3.2	4.1	4.7	6.1	3.3	5.5	3.5	3.0	2.9										
	15	1.9	1.1	—	—	—	—	1.6	2.1	1.4	—										
	30	2.9	2.2	2.8	4.2	3.7	5.5	3.2	4.0	—	4.5										
	60	4.0	1.9	4.3	4.0	1.7	3.1	4.2	2.8	3.2	1.6										
	90	2.6	1.9	—	5.0	—	—	—	—	1.6	—										
	120	2.5	3.6	4.9	4.5	4.0	4.4	5.0	2.8	8.0	4.6										
	150	3.4	1.9	3.0	7.0	4.1	4.9	5.5	6.3	5.6	5.1										

---

[1] Dashes in columns indicate no data.

[2] Waste water; depth = 0 ft.

TABLE 8.—*Magnesium in potato processing waste water and in water extracted from soil at various depths. Means of 2 sites*[1]

Processing plant	Soil depth	Dates in 1972		Dates in 1973											Dates in 1974								
		11-17	12-21	2-1	2-28	4-4	4-27	6-1		8-3	9-14	10-4	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-8	9-6
	Cm	Milliequivalents per liter																					
1-F	(2)	—	—	1.0	2.1	2.3	2.2	3.1		—	0.4	0.4	0.5	0.5	0.9	2.4	1.0	1.2	.5	1.0	—	0.9	0.7
	15	17.8	14.8	16.2	5.5	5.3	—	—		6.1	3.0	2.5	2.3	1.4	—	—	3.1	—	—	4.3	5.6	—	3.2
	30	13.1	20.0	9.3	7.5	2.6	—	10.4		—	1.9	1.9	1.6	1.6	2.5	2.9	2.3	3.7	2.3	2.1	—	3.7	2.4
	60	2.9	11.5	3.8	10.7	4.8	3.2	7.0		4.1	3.6	5.0	3.3	—	3.1	3.7	3.2	—	5.6	5.4	—	—	4.0
	90	5.1	15.7	8.4	4.9	3.7	13.8	5.2		2.7	3.6	3.7	2.6	—	2.8	3.5	1.9	2.3	2.1	2.3	—	3.2	2.2
	120	.4	10.5	6.4	—	—	—	—		3.3	2.4	2.8	1.7	3.4	5.6	—	2.5	4.0	3.0	4.2	4.1	3.2	3.5
	150	.3	1.2	1.8	—	2.3	—	2.5		.8	.9	.9	1.6	1.5	4.1	4.8	3.5	5.7	3.9	3.6	3.7	3.8	3.3
							4-27	6-1	6-29	8-3	9-14	10-4	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-15	9-6
2-F	(2)						2.8	2.4	1.8	—	.7	.7	1.0	1.0	1.7	2.0	1.6	2.2	1.0	1.8	1.9	—	1.5
	15						3.2	1.5	1.8	.7	.8	.6	1.0	1.0	—	2.0	1.8	2.5	1.5	.8	.7	1.9	1.1
	30						2.8	2.3	—	1.0	.7	1.0	1.1	1.1	2.3	2.2	1.8	2.5	1.7	.8	1.0	.7	—
	60						3.2	2.5	3.0	1.6	.9	1.3	1.1	1.0	1.8	2.0	2.0	2.5	1.6	1.2	1.0	.9	1.5
	90						1.9	2.3	3.0	1.2	.9	1.1	1.2	1.3	1.9	2.0	1.6	2.6	1.5	1.4	1.1	1.0	1.7
	120						2.1	2.6	3.2	1.4	1.0	1.1	1.3	1.2	2.3	2.6	2.0	3.0	1.9	1.8	.9	—	1.9
	150						2.7	3.1	—	—	1.1	1.2	1.0	1.4	2.4	2.8	2.4	3.1	2.1	1.5	1.5	1.3	1.7
												10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-15	9-6
3-S	(2)											.7	.9	1.0	1.1	2.0	1.9	2.9	1.6	—	—	—	.9
	15											1.7	1.5	1.6	—	—	1.0	2.3	—	—	—	3.2	—
	30											2.2	1.4	1.7	—	—	2.3	2.5	1.3	5.3	—	2.0	1.3
	60											2.0	1.7	—	—	—	2.4	1.8	1.9	4.1	4.4	1.4	1.3
	90											1.5	2.0	2.2	—	—	—	—	1.8	2.3	1.6	1.1	—
	120											.9	1.6	1.2	—	—	4.4	4.1	3.4	2.3	2.3	3.2	3.6
	150											.7	1.9	—	—	—	—	—	—	3.4	—	—	1.6
		11-17		2-1	2-28	4-4	4-27	6-1	6-29	8-3	9-14	10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-15	9-6
4-S	(2)	—		2.5	2.7	1.3	1.7	1.3	1.3	1.3	1.3	1.3	1.3	1.3	2.3	1.1	1.9	2.3	1.8	—	—	2.3	2.2
	15	—		—	—	—	1.5	1.7	—	1.8	2.4	1.4	1.6	1.5	—	—	—	3.0	2.2	—	—	1.9	2.2
	30	2.8		—	—	—	—	1.5	—	—	—	1.8	—	1.6	3.0	—	4.4	3.3	2.3	2.7	—	6.2	4.1
	60	—		—	—	—	—	1.8	2.3	3.5	4.0	1.8	—	1.3	2.8	—	—	3.7	2.0	3.0	—	6.1	7.1
	90	2.4		—	—	2.2	2.3	2.1	2.1	2.3	—	2.4	—	1.7	3.1	—	—	3.1	1.9	2.1	1.7	2.7	6.2
	120	—		—	—	—	—	—	—	—	2.2	2.5	—	—	—	—	—	—	—	—	—	—	—
	150	—		—	—	—	—	—	—	—	—	2.4	—	1.7	2.9	—	—	2.9	—	3.4	—	2.1	2.7
		11-22	12-21	1-31	2-28	4-4	4-27	6-1	6-29	8-3	9-14	10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-15	9-6
5-F	(2)	—	—	2.0	2.2	1.1	1.1	.8	1.0	.8	—	1.1	1.3	1.0	1.8	2.2	1.7	1.9	1.3	1.3	.9	—	1.7
	15	2.5	3.4	3.7	4.4	1.0	1.4	—	1.3	1.4	2.5	1.2	1.7	1.4	—	2.9	2.1	—	2.0	3.2	—	—	1.8
	30	4.9	4.2	5.3	5.5	2.6	1.9	1.8	2.0	2.2	3.4	2.5	2.5	3.0	3.4	—	2.3	3.5	1.8	—	—	1.0	1.1
	60	4.4	4.6	3.7	4.6	3.4	3.7	3.5	2.9	2.6	2.1	2.4	2.8	—	—	4.0	—	3.0	2.9	3.2	—	2.5	3.1
	90	3.8	4.5	3.2	3.2	2.0	1.5	1.7	2.1	2.1	1.9	1.7	2.3	2.3	—	3.5	3.0	5.4	3.2	2.9	4.4	3.7	3.1
	120	3.7	4.4	3.0	3.0	2.2	1.8	1.9	1.7	2.1	1.3	2.0	1.8	1.7	2.9	2.8	2.5	4.2	2.9	3.0	3.6	3.0	3.1
	150	4.2	3.9	4.1	4.0	2.3	2.6	2.3	2.2	2.1	1.7	1.5	1.7	2.4	4.2	4.3	3.4	6.5	4.3	4.3	4.8	4.0	3.6

Processing plant	Soil depth	Dates in 1974			Dates in 1975									Dates in 1976
		10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-23	8-18	9-19	
	Cm	Milliequivalents per liter												
1-F	(2)	—	0.9	—	0.4	0.8	0.7	—	1.5	0.8	0.9	0.6	0.9	
	15	—	2.5	3.2	.9	—	—	—	1.7	—	—	1.2	—	
	30	—	2.6	2.5	—	—	1.2	—	—	—	—	1.7	—	
	60	—	3.9	2.4	1.4	2.7	1.8	1.9	2.3	2.5	2.1	2.2	2.3	
	90	—	2.4	—	—	—	1.5	1.6	2.1	—	—	2.0	—	
	120	3.1	3.2	4.0	3.1	—	3.4	3.0	4.0	—	3.6	3.2	—	
	150	3.1	3.1	3.3	1.1	—	—	—	3.5	2.9	—	—	—	

		10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3	8-7	9-3	10-3	11-7	12-4	3-11	4-8	5-6	5-27	7-8
2-F	(2)	1.6	1.6	2.0	1.0	2.0	1.7	1.7	1.6	1.4	1.6	1.4	1.5	1.6	1.7	—	1.6	1.8	1.5	1.6	.8
	15	.9	.8	1.8	—	—	1.4	1.8	1.3	1.0	1.7	1.0	—	1.2	2.0	1.7	1.4	2.2	1.9	1.2	1.0
	30	1.5	.9	2.1	1.0	1.8	2.2	1.8	3.2	1.0	—	—	—	1.1	2.1	—	—	1.8	1.6	1.3	.8
	60	1.7	1.1	2.4	1.3	1.9	2.2	2.1	2.5	1.1	1.6	1.6	1.4	1.3	1.9	2.0	.8	2.2	1.7	1.4	.7
	90	1.5	1.0	2.3	1.3	2.0	2.3	2.0	2.8	.9	1.8	1.0	1.4	1.1	2.0	2.0	2.1	2.0	1.6	1.1	.7
	120	2.0	1.3	2.3	1.4	2.3	2.0	1.6	2.9	1.4	1.6	1.3	.8	1.3	2.1	2.6	—	—	3.3	1.7	1.4
	150	1.7	1.2	2.2	1.5	2.3	2.4	2.3	3.3	1.6	1.4	1.3	1.8	1.3	2.1	2.8	2.9	2.4	3.0	1.5	.9
		10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3						3-11	4-8	5-6	5-27	7-8
3-S	(2)	1.0	1.3	—	2.4	2.0	2.0	—	1.8	1.5	1.5						1.8	1.9	1.6	1.6	2.8
	15	—	1.9	1.9	—	—	—	2.3	2.3	2.6	—						—	—	1.9	—	—
	30	—	2.5	1.9	—	—	—	1.8	2.5	2.3	2.6						—	1.6	1.6	—	—
	60	2.2	2.6	3.1	—	—	—	2.3	1.8	—	—						—	1.9	—	1.7	—
	90	—	1.7	1.3	—	—	.7	2.5	2.8	2.5	—						—	—	—	—	.7
	120	3.1	3.1	2.5	—	—	—	—	—	2.4	2.2						—	1.6	1.4	1.5	1.3
	150	—	—	—	—	—	—	2.6	1.6	1.2	—						—	—	—	—	1.5
		10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3										
4-S	(2)	2.2	1.2	2.5	.9	2.2	1.9	2.2	1.9	1.6	2.0										
	15	—	2.6	2.6	—	—	—	2.8	1.4	2.2	—										
	30	4.3	3.1	3.0	1.5	4.1	—	—	2.1	1.9	—										
	60	5.6	2.4	2.6	—	—	—	—	2.1	2.1	—										
	90	6.1	4.9	2.5	1.4	2.9	—	3.3	2.5	2.5	2.4										
	120	—	—	—	—	—	—	—	—	—	—										
	150	3.4	5.0	3.9	—	—	—	2.7	3.2	3.2	2.7										
		10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3										
5-F	(2)	1.8	1.7	2.0	1.0	1.8	1.5	1.8	1.4	1.4	1.5										
	15	2.9	2.0	—	—	—	—	2.2	1.7	2.4	—										
	30	3.0	3.2	3.6	1.5	2.8	2.3	2.3	2.5	—	3.8										
	60	3.4	3.5	3.8	1.9	3.0	2.6	2.5	3.2	2.5	2.5										
	90	3.3	3.4	4.0	1.7	—	—	—	1.9	2.4	—										
	120	3.0	3.4	3.0	1.5	2.6	2.2	2.5	2.5	1.8	2.6										
	150	3.5	3.6	3.9	2.2	4.0	3.7	3.8	4.0	3.7	3.8										

[1] Dashes in columns indicate no data.
[2] Waste water; depth = 0 ft.

TABLE 9.—*Sodium in potato processing waste water and in water extracted from soil at various depths. Means of 2 sites*[1]

Processing plant	Soil depth	Dates in 1972		Dates in 1973											Dates in 1974							
		11-17	12-21	2-1	2-28	4-4	4-27	6-1		8-3	9-14	10-4	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-8
	Cm	Milliequivalents per liter																				
1-F	(2)	—	5.7	5.7	6.3	6.5	5.2	6.2		—	4.8	5.1	5.2	6.6	8.3	11.4	8.5	7.5	10.1	16.7	—	5.9
	15	—	40.6	29.4	17.0	31.7	—	—		53.0	16.7	25.0	16.7	8.0	—	—	17.2	9.2	—	44.5	23.2	—
	30	10.7	51.0	22.0	17.4	6.5	10.0	33.4		9.2	13.1	17.6	11.1	7.2	11.8	10.2	12.6	8.8	19.1	16.0	11.0	15.0
	60	4.4	27.7	10.3	18.2	21.9	—	22.0		23.1	14.4	22.4	20.7	—	11.7	11.3	13.9	—	—	31.5	—	18.0
	90	2.1	20.2	25.0	16.1	21.7	40.6	20.8		20.6	28.4	25.0	17.4	—	13.3	15.5	9.1	9.0	—	23.3	—	16.8
	120	1.5	8.5	16.0	17.1	—	—	34.2		22.3	21.3	31.0	17.5	28.4	23.3	—	9.8	31.3	15.2	22.6	5.0	12.5
	150	.4	7.0	8.1	9.1	7.8	—	8.5		6.3	8.0	7.7	9.1	9.0	13.8	12.0	12.2	16.9	15.2	33.4	16.5	8.5
							4-27	6-1	6-29	8-3	9-14	10-4	11-2	11-30	1-11	2-15	3-8	4-5	5-8	6-6	7-12	8-15
2-F	(2)						2.1	1.4	2.0	—	1.4	1.2	2.1	1.8	1.9	2.0	2.3	1.8	1.2	1.5	1.4	—
	15						1.1	.8	1.0	.6	.9	1.1	1.3	1.6	—	1.5	1.6	2.0	1.6	.5	.5	.4
	30						1.4	.9	—	.7	.6	1.0	1.6	1.6	2.0	1.9	1.7	2.0	1.5	.5	.4	.4
	60						.9	.4	.5	1.0	.7	2.8	1.6	1.7	2.1	2.0	1.7	2.1	—	.5	.4	.5
	90						.3	.3	.4	.9	.9	1.3	1.7	1.8	2.3	2.1	1.7	2.2	.6	.4	.4	.5
	120						.8	.4	.5	.8	.5	.6	1.1	1.4	1.5	1.6	1.5	2.9	1.6	.8	6.4	—
	150						1.0	.4	.5	1.2	.8	.8	1.3	1.4	1.6	1.6	1.4	1.9	1.4	.8	.7	1.0

See footnote at end of table.

TABLE 9.—*Sodium in potato processing waste water and in water extracted from soil at various depths. Means of 2 sites*[1]

Processing plant	Soil depth	Dates in 1972		Dates in 1973											Dates in 1974							
												10-5	11-2	11-30	1-11	2-15	3-8		5-3		7-12	8-15
	Cm	*Milliequivalents per liter*																				
3-S	(2)											11.6	13.3	15.5	27.0	.9	—		14.0		—	—
	15											8.3	8.0	12.7	—	—	6.5		—		—	7.2
	30											6.5	7.8	6.3	—	—	11.5		9.6		—	9.1
	60											3.8	7.4	—	—	—	11.5		—		14.0	9.7
	90											1.3	5.5	11.0	—	—	—		—		9.9	4.6
	120											5.3	3.8	4.8	—	—	4.7		5.8		6.9	6.2
	150											4.2	3.5	—	—	—	—		—		—	—
				1-31	2-28	4-4	4-27	6-1	6-29	8-3	9-14	10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-15
4-S	(2)			1.8	2.1	2.9	2.3	2.5	2.5	2.6	2.5	2.2	2.8	2.5	1.7	2.8	2.8	2.3	2.2	—	—	3.6
	15			—	—	—	2.6	3.4	—	3.4	4.1	3.2	3.4	2.7	4.7	—	—	2.7	2.3	—	—	4.4
	30			—	—	—	—	2.5	—	—	—	3.6	—	2.8	2.8	—	5.0	2.8	2.5	3.4	—	6.9
	60			—	—	1.4	—	2.9	2.2	4.1	4.6	2.8	—	2.5	2.7	—	—	3.1	—	3.2	—	7.2
	90			—	—	1.2	2.4	2.1	2.2	2.9	—	2.0	—	2.8	3.0	—	—	2.7	2.5	2.9	—	3.9
	120			—	—	—	—	—	—	3.1	2.8	2.1	—	—	—	—	—	—	—	—	—	—
	150			—	—	—	—	—	—	—	—	2.5	—	2.9	3.0	—	—	2.9	—	2.6	2.9	3.3
		11-22	12-21	1-31	2-28	4-4	4-27	6-1	6-29	8-3	9-14	10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-15
5-F	(2)	—	—	2.8	3.5	3.4	3.9	2.3	2.9	—	—	2.2	2.3	2.3	2.8	2.8	4.8	3.2	1.7	2.1	.2	—
	15	1.9	2.0	2.0	1.8	.8	1.8	—	4.7	3.3	7.2	3.2	5.0	2.0	—	2.5	3.3	3.4	—	4.0	—	—
	30	2.3	2.0	1.5	2.0	2.2	2.2	2.6	3.9	4.0	3.5	4.3	4.1	4.6	2.5	—	3.1	3.3	2.7	—	—	4.8
	60	2.5	1.5	1.5	1.8	2.2	2.8	2.9	2.7	2.0	2.1	—	1.2	1.5	—	3.4	—	3.5	3.6	3.5	—	3.8
	90	.8	.9	1.1	.9	1.5	1.7	1.8	2.2	1.6	1.2	1.2	1.4	1.4	—	2.1	2.3	2.3	2.1	2.2	2.6	2.4
	120	.6	.8	.4	.5	.8	1.2	1.3	2.0	2.0	1.8	1.7	1.3	1.0	.9	1.0	1.5	2.3	1.4	2.0	2.2	2.1
	150	.4	.5	.4	.5	.7	.7	.8	.8	.7	.7	.8	.8	.9	1.0	1.2	1.2	1.1	1.3	1.2	1.2	1.4

Processing plant	Soil depth	Dates in 1974				Dates in 1975												Dates in 1976				
		9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-23	8-18	9-19								
	Cm	*Milliequivalents per liter*																				
1-F	(2)	5.0	—	6.0	6.4	7.4	4.8	6.7	—	1.3	6.6	6.8	5.6	5.5								
	15	12.4	—	16.2	15.7	9.8	—	7.2	—	10.4	—	—	9.8	—								
	30	12.5	—	14.0	12.6	—	—	10.6	—	—	—	—	9.7	—								
	60	14.9	—	14.5	10.1	9.1	8.7	6.9	7.2	7.5	9.5	10.4	10.9	11.0								
	90	11.5	—	9.5	—	—	—	7.0	7.2	8.3	—	—	10.4	—								
	120	17.5	16.5	15.9	17.0	19.4	—	12.6	12.2	15.7	—	17.1	16.8	—								
	150	17.0	16.5	16.0	15.7	15.8	—	—	—	16.2	16.1	—	—	—								
		9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3	8-7	9-3	10-3	11-7	12-4	3-11	4-8	5-6	5-27	7-8
2-F	(2)	1.4	1.7	1.4	2.4	3.4	2.0	2.2	1.8	1.3	1.7	1.4	1.3	1.5	1.8	1.4	—	1.5	2.2	1.6	1.9	1.0
	15	.5	.6	.3	1.3	—	—	1.4	1.5	1.3	1.1	1.5	1.4	.9	.8	1.9	1.5	1.7	2.1	1.7	1.0	1.4
	30	—	.7	.6	1.6	1.6	1.6	1.7	1.6	2.0	1.5	—	.5	.7	.7	1.6	1.6	—	2.0	1.8	.9	1.1
	60	.5	.7	.8	1.9	5.5	1.6	1.6	1.7	1.8	1.0	.9	.7	.6	.7	2.1	1.7	1.9	2.4	1.8	.8	.9
	90	.6	.7	.7	1.6	2.0	1.6	1.8	1.7	1.8	.8	.7	.5	.5	.7	1.7	1.9	1.7	2.2	1.6	.8	.9
	120	.8	.7	.8	1.5	2.1	1.6	1.6	1.7	1.5	1.0	1.0	.9	.8	.9	1.8	1.9	—	2.2	1.9	1.0	1.2
	150	.8	.8	.7	1.3	1.4	1.5	1.5	2.2	1.6	1.1	.9	.7	.7	.7	1.8	1.5	1.9	2.0	1.9	.9	1.1
		9-6		11-1	12-12		2-7	3-7	4-4	5-8	6-6	7-3		9-3	10-3	11-7		3-11	4-8	5-6	5-27	7-8
3-S	(2)	8.6		13.0	—		7.5	10.4	—	4.1	17.0	13.7		—	—	16.3		8.7	5.6	2.2	3.3	23.6
	15	4.6		10.7	11.2		—	—	5.8	5.4	15.2	—		—	—	—		—	—	4.5	—	—
	30	5.4		12.0	10.4		—	—	6.4	7.6	8.3	13.8		—	.7	4.8		—	2.1	2.6	—	—
	60	7.3		9.6	10.2		—	—	7.2	6.8	—	—		—	—	—		—	3.0	—	3.1	—
	90	—		8.0	7.7		—	3.2	7.1	5.1	5.6	—		11.8	—	6.9		—	—	—	—	1.0
	120	7.7		11.0	10.7		—	—	—	10.0	9.6	8.8		—	8.9	—		—	3.6	3.3	3.7	.9
	150	1.6		—	—		—	—	13.6	—	—	—		—	—	—		—	—	—	—	1.8

		9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3
4-S	([2])	3.0	2.3	1.4	3.7	10.8	2.6	3.4	3.0	2.3	2.4	1.8
	15	3.5	—	3.5	3.6	—	—	—	3.3	2.2	5.8	—
	30	6.4	6.2	4.8	5.2	4.7	4.4	—	3.7	2.8	3.1	5.0
	60	9.8	8.5	5.5	5.7	—	—	—	5.2	4.2	3.8	4.0
	90	7.9	7.7	—	6.5	5.8	4.7	—	4.4	—	3.6	4.0
	120	4.0	—	—	—	—	—	—	—	—	—	—
	150	5.0	4.3	6.5	5.7	—	—	—	3.4	—	1.3	2.8

		9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3
5-F	([2])	2.2	2.2	2.5	3.9	2.0	3.0	2.8	13.4	3.7	4.3	2.4
	15	3.8	3.1	2.4	—	—	—	—	2.7	2.5	3.5	—
	30	4.4	3.9	3.9	4.7	3.6	2.8	2.9	3.0	2.5	2.9	4.4
	60	3.9	3.1	3.7	4.6	4.4	3.5	3.6	3.8	4.0	3.9	4.3
	90	2.4	2.3	2.4	—	1.0	—	2.7	—	—	2.9	3.5
	120	2.1	2.4	2.8	2.8	3.6	1.4	2.6	2.3	2.5	1.8	2.2
	150	1.5	1.5	1.4	1.9	1.8	1.6	1.6	1.7	1.9	1.9	1.9

---

[1] Dashes in columns indicate no data.
[2] Waste water; depth = 0 ft.

TABLE 10.—*Electrical conductivity in potato processing waste water and in water extracted from soil at various depths. Means of 2 sites*[1]

Processing plant	Soil depth	Dates in 1972		Dates in 1973											Dates in 1974						
		11-17	12-21	2-1	2-28	4-4	4-27	5-31		8-3	9-14	10-4	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12
	Cm	μmhos/centimeter[1]																			
1-F	([2])	—	1215	1200	1230	1480	1280	1260		—	1040	1040	1260	1300	1420	1675	1650	1490	1420	1280	800
	15	7450	5845	4080	2647	4000	—	—		6000	2050	2900	2190	1320	—	—	2405	2600	1650	3100	3200
	30	4750	8200	3800	3250	2265	—	5000		1320	2060	1805	1705	1400	1560	2095	2005	2550	1700	1550	1550
	60	795	4365	1650	2947	3161	1625	3620		3650	3250	3050	2910	—	1180	1832	1975	1410	—	2475	—
	90	2155	3260	3605	2185	2840	5700	3080		3100	3650	2600	2490	—	1010	2400	1350	1775	—	1800	—
	120	377	1460	2690	3080	5180	1440	5200		2925	2770	2540	2170	3550	3030	—	1675	2350	1810	2300	2500
	150	215	867	1330	1150	1050	1400	1290		1300	1245	1280	1567	1465	2250	2042	1815	—	2400	1820	2540
							4-27	6-1	6-29	8-3	9-14	10-4	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12
2-F	([2])						1235	720	950	—	760	760	900	845	840	1000	1100	1000	800	900	700
	15						790	777	690	535	650	850	777	800	—	852	882	1060	990	430	425
	30						1057	792	—	740	625	895	847	822	1100	1045	1040	1125	1030	500	405
	60						890	745	765	897	600	1145	892	855	960	1080	1065	1115	—	550	485
	90						545	660	820	975	740	900	895	932	1010	1080	1030	1160	1040	545	397
	120						817	782	885	940	705	775	810	897	970	1082	1070	1630	1000	720	595
	160						952	760	600	940	635	790	875	886	1020	1150	1015	1240	1110	690	580
												10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12
3-S	([2])											1530	2010	2025	600	1850	2250	2900	2700	1280	—
	15											1460	1505	1447	—	—	1060	1310	—	—	—
	30											1720	1190	1425	—	—	1480	1500	1525	210	—
	60											1502	1440	935	—	—	1900	1410	—	2250	3000
	90											1200	1475	2200	—	—	—	1220	1440	1950	1480
	120											1142	1325	1125	—	—	2000	1820	1750	—	1385
	150											815	950	990	—	—	—	1430	—	1800	—
		11-22		1-31	2-28	3-27	4-4	6-1	6-29	8-3	9-14	10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12
4-S	([2])	—		1190	1275	1525	1280	1420	1510	1460	1265	1030	1090	1170	1060	1130	1220	1010	1080	—	—
	15	—		—	—	1550	—	1320	—	1740	1950	1140	—	1147	—	—	—	1220	900	—	—
	30	1030		—	—	1530	1490	1310	1250	—	—	1470	—	1155	1410	—	2090	1244	1250	1400	—
	60	—		800	—	—	900	1130	1200	2500	2280	1200	—	1110	1320	—	—	1335	1320	1240	—
	90	915		—	—	1212	675	1150	1510	1570	—	1530	—	1110	1420	—	—	1170	1440	1300	1160
	120	—		—	—	—	—	940	—	—	1940	1280	—	—	—	—	—	—	—	—	—
	160	—	—		—	—	—	—	—	—	—	1462	—	930	1120	—	—	1020	—	1050	—

See footnote at end of table.

TABLE 10.—*Electrical conductivity in potato processing waste water and in water extracted from soil at various depths. Means of 2 sites*[1] —*Continued.*

Processing plant	Soil depth	Dates in 1972		Dates in 1973												Dates in 1974						
		11-22	12-21	1-31	2-28	4-4	4-27	6-1	6-29	8-3	9-14	10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12
	Cm	μmhos/centimeter^2																			
5-F	([2])	—	—	1130	1560	1460	1460	1020	1220	—	—	1180	1120	1030	1080	1060	1420	—	1160	780	—
	15	1130	1957	1330	1157	620	1037	—	1140	1305	1750	940	1395	940	—	1007	1010	1000	—	1080	—
	30	1220	1310	1480	1345	1000	1112	1065	1197	1195	1640	1475	1260	1120	930	—	915	967	1020	—	—
	60	1180	1365	1270	1222	950	1712	1197	1425	1260	1005	—	835	830	—	840	—	1260	950	1040	—
	90	1155	1490	1300	1100	900	1175	1025	1255	1350	1000	1060	1145	865	—	875	825	865	930	890	1500
	120	1175	1435	1240	1220	1030	1225	1120	1440	1110	1300	1280	1260	1240	820	1300	1200	1235	1200	1080	1020
	150	1290	1290	1030	600	805	1075	1062	1310	1320	1385	1280	1185	1290	915	1375	1110	760	1155	1335	1370

Processing plant	Soil depth	Dates in 1974					Dates in 1975												Dates in 1976			
		8-8	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-23	8-18	9-19				1-8		3-11	5-27
	Cm	μmhos/centimeter^2																				
1-F	([2])	1380	1260	1230	—	1375	1410	1320	1525	—	890	1440	1470	880	1460				1800			1260
	15	1340	2855	—	2130	2100	1540	—	—	—	1750	—	—	1530	—				—			—
	30	—	1900	—	2010	1780	—	—	1735	—	—	1850	—	1435	—				—			—
	60	1750	2550	—	2390	1440	1500	1260	1260	1060	1430	—	1800	1700	1725				—			—
	90	2175	1800	—	2270	—	—	—	1160	1160	1440	—	1850	1445	—				—			—
	120	1850	2600	2150	2350	2150	2950	—	2050	1750	2400	—	2480	2100	—				—			—
	150	1020	2530	2200	2360	2060	2110	—	—	—	2050	—	2300	—	—				—			—
		8-15	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3	8-7	9-3	10-3	11-7	12-4	1-8	2-5	3-11	4-8
2-F	([2])	—	820	955	1020	1160	1225	1050	1450	1020	940	1100	950	550	710	870	1018	1011	1100	1095	1000	1040
	15	305	465	490	385	585	—	—	810	860	750	575	650	560	490	510	940	900	817	990	725	665
	30	350	—	585	405	785	945	840	980	970	1525	635	570	540	520	495	910	935	—	1027	1032	659
	60	480	692	747	587	805	1040	795	760	1070	1437	720	835	515	625	548	1070	890	1000	970	940	710
	90	360	630	662	465	920	1060	760	1020	990	860	557	680	485	595	539	985	1070	960	1190	960	691
	120	107	790	757	600	902	990	895	1020	1055	1170	785	790	540	660	624	836	1100	—	—	740	690
	150	429	685	592	555	785	835	805	1020	1040	1160	845	785	560	605	605	895	1000	800	1097	750	685
		8-15	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3	8-7	9-3	10-3	11-7	12-4	1-8	2-5	3-11	4-8
3-S	([2])	—	1500	1180	2000	—	1320	2175	2000	—	2450	2500	2100	—	—	—	2390	—	1700	1930	1265	1545
	15	2400	1020	—	1665	1350	—	—	—	1580	2100	2400	—	—	—	—	—	—	—	—	1655	—
	30	1500	965	—	1975	1350	—	—	—	1335	2200	2000	2700	—	4700	591	1250	910	—	1082	1090	—
	60	1200	1095	260	1700	1390	—	—	—	1800	1160	—	2060	—	2650	—	—	—	—	1200	—	1380
	90	390	—	—	1580	1125	—	—	680	—	1650	—	—	—	2600	—	1160	—	—	—	—	—
	120	1160	1750	1607	1560	1450	—	—	—	—	—	1550	1120	1230	1200	1100	—	—	—	790	800	850
	150	—	860	—	—	—	—	—	—	2800	—	—	—	—	—	—	—	—	—	—	—	—
		8-15	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3									
4-S	([2])	1320	1240	1215	730	1595	2000	1400	1180	1330	1340	1060	980									
	15	1320	1550	—	1430	1250	—	800	—	1060	930	1340	—									
	30	3300	2375	2306	1585	1240	1535	—	—	—	1285	1120	1650									
	60	3400	4000	3220	1580	1390	—	—	—	1360	1525	—	—									
	90	1900	4000	—	3900	1450	1350	—	—	1310	—	1860	1400									
	120	—	2050	—	—	—	—	—	—	—	—	—	—									
	150	840	2085	1410	2430	1780	—	—	—	1040	—	—	1040									
		8-15	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3									
5-F	([2])	—	1280	1280	1120	1500	1105	1440	1200	2150	1430	1220	1040									
	15	900	1270	900	—	—	—	—	—	—	900	—	—									
	30	940	860	1165	1430	1065	1092	860	1090	745	1070	—	1290									
	60	1340	1380	1280	1405	1087	1115	785	860	785	860	980	1115									
	90	1220	955	945	787	—	700	—	—	—	—	—	1000									
	120	1090	1185	1082	1202	952	1035	860	860	855	—	1080	1640									
	150	1320	1340	1195	1290	797	1167	785	935	880	1045	1160	1305									

---

[1] Dashes in columns indicate no data.

[2] Waste water; depth = 0 ft.

TABLE 11.—*pH in potato processing waste water and in water extracted from soil at various depths. Means of 2 sites*[1]

Processing plant	Soil depth	Dates in 1972		Dates in 1973											Dates in 1974							
		11-17	12-21	2-1	2-28	4-4	4-27	6-1		8-2	9-14	10-4	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	
	Cm	pH																				
1-F	([2])	—	5.4	6.4	6.1	—	6.9	7.1		—	7.1	6.4	6.2	6.4	6.1	5.6	5.8	5.8	7.2	6.7	7.2	
	15	8.3	8.3	8.3	8.3	8.3	—	—		8.2	8.4	8.7	8.3	8.5	—	—	7.7	8.4	—	8.4	8.1	
	30	7.8	—	7.7	8.1	8.2	—	7.6		8.6	8.2	8.7	7.6	7.5	8.0	7.3	7.2	8.3	—	8.3	8.5	
	60	8.3	7.7	8.3	8.1	8.5	8.2	7.8		8.1	8.2	8.7	7.5	8.5	7.7	8.1	7.3	8.8	—	8.1	—	
	90	8.0	7.4	7.8	8.1	8.4	8.0	8.0		7.6	8.0	8.5	8.0	—	7.5	8.0	7.8	8.2	—	8.5	7.6	
	120	8.8	7.4	7.3	8.2	—	—	7.9		8.2	8.1	8.5	8.1	8.4	8.2	—	7.0	7.3	7.3	7.6	7.4	
	150	7.9	7.0	7.9	8.2	8.3	8.8	7.9		8.0	8.1	8.3	7.6	8.4	7.1	7.5	7.7	6.8	7.6	8.0	—	
							4-27	6-1	6-29	8-3	9-14	10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	
2-F	([2])						6.5	6.9	6.7	—	7.1	6.8	6.9	6.8	6.7	6.6	7.0	6.7	7.2	6.9	6.8	
	15						7.2	8.3	8.0	—	8.2	8.3	7.5	6.9	—	7.7	7.7	7.1	7.2	8.0	7.6	
	30						7.3	8.0	—	8.3	8.3	8.4	7.9	7.1	8.2	6.9	7.4	7.3	7.4	7.8	7.6	
	60						7.5	8.0	7.8	8.1	8.0	8.3	7.9	7.3	6.6	7.2	7.8	7.3	—	7.9	7.5	
	90						7.6	7.9	7.8	8.1	8.0	8.1	7.9	7.9	7.9	6.9	7.3	7.4	7.1	8.0	7.3	
	120						7.6	8.1	7.8	7.6	8.2	8.0	7.7	7.5	7.4	7.6	7.6	7.5	7.5	8.1	7.8	
	150						7.6	7.9	8.1	8.1	8.3	8.2	7.8	8.0	7.4	7.3	7.6	7.4	7.6	7.8	7.5	
3-S												10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	
	([2])											8.0	6.8	6.7	6.4	6.2	5.2	6.5	6.5	—	—	
	15											8.0	7.8	8.4	—	—	7.6	8.3	—	—	—	
	30											7.9	8.1	8.2	—	—	7.8	8.0	8.2	7.9	—	
	60											7.8	7.8	8.7	—	—	8.2	8.1	—	7.6	7.9	
	90											7.6	7.8	7.4	—	—	—	—	8.1	8.0	8.2	
	120											7.8	7.7	8.0	—	—	7.2	7.6	7.3	8.2	7.9	
	150											8.3	8.2	7.2	—	—	—	—	—	7.6	—	
		11-22		1-31	2-28	4-4	4-27	6-1	6-29	8-3	9-14	10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	
4-S	([2])	—		6.1	6.2	6.2	6.1	6.8	6.2	6.4	6.8	6.8	6.2	6.1	6.2	6.4	5.9	5.9	6.9	—	—	
	15	—		—	—	—	8.0	8.2	—	8.3	8.2	8.3	8.2	8.5	8.5	—	—	8.5	8.2	—	—	
	30	8.4		—	—	8.1	8.0	8.1	—	—	—	8.3	—	8.0	7.1	—	7.3	8.2	8.1	8.1	—	
	60	—		8.3	—	8.2	8.3	8.3	7.8	7.9	8.3	8.0	—	7.5	8.8	—	—	8.4	—	8.0	—	
	90	8.2		—	—	7.8	8.1	8.1	7.5	8.1	—	8.0	—	7.8	7.4	—	—	7.3	7.9	7.7	7.3	
	120	—		—	—	—	—	—	—	—	8.4	8.0	—	—	—	—	—	—	—	—	—	
	150	—		—	—	—	—	—	—	—	—	8.2	—	8.5	8.0	—	—	7.9	—	8.3	—	
		11-22	12-21	1-31	2-28	4-4	4-27	6-1	6-29	8-3	9-14	10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12	
5-F	([2])	—	—	6.7	6.0	6.7	6.1	7.1	6.7	—	—	6.9	6.8	6.3	6.4	6.6	6.0	6.0	7.3	6.5	—	
	15	8.2	7.6	7.7	7.6	8.3	7.9	—	7.8	7.9	7.9	8.2	7.5	7.6	—	8.3	7.7	8.4	—	—	—	
	30	7.8	7.5	7.8	7.1	8.2	7.8	7.8	7.4	7.9	7.7	7.7	8.1	8.3	7.4	—	8.4	8.2	7.9	—	—	
	60	7.9	7.3	7.5	7.4	8.1	7.3	7.8	7.4	7.8	8.1	—	8.8	8.6	—	8.5	—	7.6	7.7	—	—	
	90	7.6	7.2	7.9	7.6	7.7	7.5	7.6	7.2	7.7	8.0	7.9	7.9	8.4	—	8.1	8.1	8.1	8.1	—	7.6	
	120	7.8	7.1	7.7	7.5	7.6	7.3	7.5	7.2	7.8	7.2	7.2	7.4	7.4	7.7	7.3	8.4	7.6	7.5	—	7.9	
	150	6.9	6.9	7.9	7.6	8.0	7.6	7.5	7.3	7.5	7.3	7.2	7.4	7.5	7.6	8.0	7.8	7.7	7.5	—	7.2	

Processing plant	Soil depth	Dates in 1974					Dates in 1975									Dates in 1976	
		8-8	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-23	8-18	9-19	3-11	5-27
	Cm	pH															
1-F	([2])	7.7	7.1	—	6.4	7.8	7.9	7.3	6.4	—	6.6	5.4	6.8	7.7	7.0	6.0	6.3
	15	—	7.6	—	8.2	8.4	7.9	—	—	—	8.0	—	—	8.2	—	—	—
	30	8.2	7.6	—	8.3	8.2	—	—	8.6	—	—	—	—	7.9	—	—	—
	60	—	7.9	—	8.2	8.4	8.1	8.5	7.9	7.6	8.0	8.6	7.3	8.2	7.8	—	—
	90	8.1	7.8	—	—	—	—	—	8.2	7.6	8.0	—	—	8.2	—	—	—
	120	7.9	7.5	8.1	8.0	8.3	7.9	—	8.0	7.4	7.3	—	7.8	8.2	—	—	—
	150	8.2	6.9	7.9	7.9	—	8.2	—	—	—	8.0	—	—	—	—	—	—

See footnote at end of table.

TABLE 11.—*pH in potato processing waste water and in water extracted from soil at various depths. Means of 2 sites—Continued.*

Processing plant	Soil depth	Dates in 1974					Dates in 1975												Dates in 1976			
		8-15	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3	8-7	9-3	10-3	11-7	12-4	3-11	4-8	5-6	5-27
	Cm	*pH*																				
2-F	([2])	—	7.2	6.4	6.6	7.2	7.5	7.2	7.6	7.6	6.8	6.5	7.0	7.3	7.1	7.0	6.9	—	8.0	7.5	7.7	7.4
	15	7.6	8.0	8.0	7.4	8.2	—	—	8.6	8.0	7.5	8.0	8.2	7.5	7.4	6.6	7.9	8.3	8.0	7.9	7.9	7.8
	30	7.5	—	7.8	7.4	8.0	8.0	8.0	8.7	7.8	7.6	8.2	—	7.1	7.7	7.4	7.8	8.5	—	7.9	7.5	7.8
	60	7.7	8.0	7.7	7.3	8.0	7.9	8.5	8.7	7.9	8.1	8.0	8.0	8.0	7.6	7.5	6.5	8.2	—	—	—	7.9
	90	7.6	7.9	7.5	7.5	8.1	7.8	8.2	8.8	8.1	8.4	8.2	8.0	7.5	6.1	7.0	7.2	8.3	7.9	7.7	—	7.8
	120	—	7.7	7.5	7.4	8.1	7.8	7.7	8.3	7.7	7.5	7.9	7.9	7.3	7.6	7.1	7.4	8.2	—	—	—	7.7
	150	7.5	7.8	7.7	7.5	8.0	7.9	7.7	8.1	7.5	7.5	7.9	7.9	7.2	6.8	7.0	7.4	8.1	6.8	7.8	7.9	7.9
		8-15	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3		9-3	10-3	11-7		3-11	4-8	5-6	5-27
3-S	([2])	—	7.2	7.3	6.7	—	7.8	6.8	6.1	—	5.8	5.8	6.6		—	—	6.5		7.2	7.0	6.9	6.9
	15	7.0	—	—	7.9	8.4	—	—	—	7.6	7.9	8.6	—		—	—	—		—	—	8.0	—
	30	7.7	7.6	—	7.8	8.4	—	—	8.1	8.0	8.4	8.0	8.3		—	8.0	7.0		—	—	—	—
	60	8.0	7.8	8.0	7.7	8.0	—	—	—	7.5	8.6	—	—		—	—	—		—	—	—	—
	90	8.3	—	—	8.1	8.3	—	—	6.5	8.0	7.9	—	—		7.6	—	7.7		—	—	—	—
	120	7.7	7.7	8.3	7.7	7.7	—	—	—	—	8.4	7.5	8.6		—	7.9	—		—	—	8.3	8.1
	150	—	7.9	—	—	—	—	—	—	7.3	—	—	—		—	—	—		—	—	—	—
		8-15	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3									
4-S	([1])	7.4	6.6	7.0	6.6	7.7	7.2	7.2	6.8	6.4	6.4	6.5	7.2									
	15	7.7	7.2	—	7.8	8.4	—	—	—	7.7	8.1	8.6	—									
	30	7.9	7.8	8.1	7.7	8.4	7.7	8.7	—	—	7.8	8.5	—									
	60	7.4	7.8	7.8	8.2	8.5	—	—	—	7.8	8.4	—	8.4									
	90	7.5	7.6	7.2	7.2	8.4	8.0	—	—	7.7	—	8.0	7.7									
	120	—	—	—	—	—	—	—	—	—	—	—	—									
	150	7.8	7.9	7.5	7.4	7.5	—	—	—	7.7	—	—	8.1									
		8-15	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-8									
5-F	([2])	—	—	—	—	6.8	7.6	8.2	7.2	6.9	6.5	7.7	7.1									
	15	—	7.8	8.1	7.8	—	—	—	—	6.8	8.0	—	—									
	30	7.7	8.2	8.0	7.5	7.9	7.8	8.1	8.1	6.6	7.6	—	7.7									
	60	7.4	7.8	7.9	7.5	7.8	7.9	8.6	8.4	7.1	7.8	7.9	7.8									
	90	7.6	8.1	8.0	7.7	—	8.1	—	—	—	—	—	8.5									
	120	7.6	7.2	8.0	7.6	8.0	8.0	8.1	7.9	7.2	7.4	—	7.6									
	150	7.5	7.3	7.6	7.5	8.0	7.9	8.4	8.0	7.2	7.5	7.4	7.8									

[1] Dashes in columns indicate no data.
[2] Waste water; depth = 0 ft.

TABLE 12.—*Chloride in potato processing waste water and in water extracted from soil at various depths. Means of 2 sites*[1]

Processing plant	Soil depth	Dates in 1972		Dates in 1973										Dates in 1974						
		11-17	12-21	2-1	2-28	4-4	5-1	6-1	8-3	9-14	10-4	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12
	Cm	*Milliequivalents per liter*																		
1-F	([2])	—	2.3	1.3	1.2	1.4	1.5	1.2	—	1.0	1.4	1.5	0.9	1.5	1.7	2.6	1.5	0.8	1.0	—
	15	—	—	8.6	3.2	4.3	—	—	6.9	.3	7.7	5.3	1.2	—	—	8.2	—	—	7.1	3.5
	30	—	—	6.3	4.7	2.4	—	9.2	.8	.7	3.8	3.3	1.4	3.4	3.0	3.9	1.4	1.7	2.5	2.7
	60	—	—	1.7	4.8	3.5	1.3	3.4	3.0	3.8	7.6	5.7	—	2.4	3.2	3.2	—	4.5	3.0	—
	90	5.7	8.2	6.3	3.8	5.0	11.0	3.8	3.1	5.2	5.5	4.2	—	4.5	4.0	2.6	1.2	—	2.8	—
	120	—	2.7	5.8	1.5	12.7	—	11.9	4.5	4.1	6.0	3.4	7.2	6.4	—	1.8	2.7	2.9	3.3	2.1
	150	—	1.4	2.2	—	1.7	—	2.6	1.8	2.0	2.4	2.8	4.2	5.1	3.5	3.4	5.3	5.2	3.6	6.0

							4-27	6-1	6-29	8-3	9-14	10-4	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12
2-F	(2)						2.0	1.0	1.7	—	1.2	.8	1.8	1.2	1.3	1.6	1.6	1.0	.6	.4	1.4
	15						1.1	.4	.6	.4	.7	.8	1.1	1.1	—	1.0	.7	1.3	1.0	.4	.4
	30						1.5	.5	—	.5	.6	1.0	1.0	1.0	1.5	1.4	1.0	1.4	.8	.4	.4
	60						1.1	.8	.9	.9	.6	1.1	1.3	1.1	1.7	1.5	1.1	1.4	—	.4	.4
	90						.1	.8	1.2	.9	.5	.6	1.4	1.2	1.5	1.5	1.2	1.2	.9	.4	.4
	120						.6	1.2	1.1	1.0	.4	.5	.9	1.1	1.4	1.1	1.8	.9	1.0	.3	.5
	150						1.1	1.1	1.0	—	.4	.5	.9	1.2	1.5	1.3	1.3	1.4	.8	.7	.5
												10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12
3-S	(2)											1.0	2.3	2.3	.8	2.2	2.3	2.3	4.2	—	—
	15											1.8	.9	1.4	—	—	.1	.4	—	—	—
	30											1.3	1.0	1.5	—	—	.9	.2	.4	2.0	—
	60											1.1	1.0	—	—	—	1.0	—	—	—	1.4
	90											1.1	1.2	.5	—	—	—	—	1.2	.9	1.5
	120											.7	1.0	.4	—	—	1.4	.8	1.0	1.6	1.7
	150											.2	.9	—	—	—	—	—	—	1.1	—
		11-22	12-21	1-31	2-28	4-4	4-27	6-1	6-29	8-3	9-14	10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12
4-S	(2)	1.4	1.4	2.0	2.2	2.8	1.9	2.4	2.3	2.3	2.4	1.9	2.3	1.9	1.6	2.3	2.0	1.7	2.1	—	—
	15	—	—	—	—	2.1	2.6	2.7	—	3.3	4.7	2.3	2.4	2.1	4.5	—	—	—	.9	2.4	—
	30	.7	—	—	—	2.9	—	2.8	—	—	—	2.8	—	2.2	2.2	—	3.2	2.5	2.4	2.4	—
	60	—	—	—	—	1.6	—	2.0	3.1	3.9	7.0	2.0	—	2.1	2.2	—	—	1.9	2.6	2.1	—
	90	2.0	—	—	—	1.7	2.5	2.7	3.2	3.7	—	2.8	—	2.1	2.3	—	—	1.7	2.3	—	2.9
	120	—	—	—	—	—	—	—	—	—	—	2.8	—	—	—	—	—	—	—	3.2	—
	150	—	—	—	—	—	—	—	—	—.8	—	2.5	—	2.1	2.2	—	—	—	—	—	—
		11-22	12-21	1-31	2-28	4-4	4-27	6-1	6-29	8-3	9-14	10-5	11-2	11-30	1-11	2-15	3-8	4-5	5-3	6-6	7-12
5-F	(2)	—	.9	1.4	1.0	1.0	1.0	1.0	1.1	.7	—	1.3	1.0	.6	.8	.7	.9	.8	.3	1.0	.9
	15	1.8	1.7	1.5	1.6	.6	1.3	—	.4	.8	1.7	—	1.5	1.1	—	1.4	—	—	—	.5	—
	30	—	.9	1.2	1.1	1.1	1.0	.9	1.3	1.2	.6	1.4	.8	.7	1.3	—	.7	.8	.4	—	—
	60	.6	.7	1.0	1.0	1.3	1.8	1.8	1.7	1.4	1.3	1.7	.8	—	—	1.2	—	.9	.8	1.4	—
	90	.8	.9	1.3	1.2	1.4	1.4	1.2	1.2	1.1	1.1	1.2	1.1	1.0	—	1.4	2.9	.6	.7	1.2	1.1
	120	.7	.9	.9	1.0	1.3	1.3	1.5	1.6	.9	1.2	1.3	1.2	1.1	1.2	1.3	.9	.8	.9	1.3	.9
	150	.7	.7	.8	.9	.8	.9	.9	.9	.8	1.0	1.0	.9	.9	1.0	1.2	.7	.7	.7	1.1	.9

Processing plant	Soil depth	Dates in 1974					Dates in 1975												Dates in 1976		
		8-8	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-23	8-18	9-19			12-4			
	Cm										*Milliequivalents per liter*										
1-F	(2)	1.8	3.0	—	1.5	2.5	2.4	2.0	2.4	—	0.9	3.2	1.6	1.2	1.2			2.4			
	15	4.0	3.3	—	2.6	3.2	3.1	—	—	—	1.9	—	—	1.6	—			—			
	30	—	2.6	—	3.0	2.6	—	—	3.4	—	—	—	—	2.0	—			—			
	60	3.6	3.6	—	2.6	1.6	3.2	1.8	1.8	1.6	1.3	1.9	5.5	2.1	1.9			—			
	90	4.0	1.9	—	6.0	4.0	—	—	1.8	1.7	1.6	—	2.4	2.1	—			—			
	120	2.7	3.7	4.1	3.4	5.4	6.2	—	3.3	3.0	3.5	—	2.1	3.0	—			—			
	150	1.8	6.1	6.0	5.7	1.6	6.1	—	—	—	4.9	—	3.5	—	—			—			
		8-15	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3	8-7	9-3	10-3	11-7	12-4	1-8	2-5	3-11
2-F	(2)	—	.9	1.6	1.2	1.8	1.9	1.8	1.9	1.2	1.6	1.5	1.1	1.1	1.3	1.6	1.3	2.1	1.7	2.4	.6
	15	.5	—	.2	.3	1.3	—	—	1.2	1.3	.3	1.0	.1	.3	.1	.4	1.3	2.6	1.9	—	.7
	30	.4	.3	.4	.4	1.3	2.3	1.4	1.5	1.1	.6	.6	—	.4	.1	.3	1.4	—	—	—	1.1
	60	.4	.3	.4	.5	1.4	2.0	1.4	1.7	1.3	.9	.3	.6	.3	.1	.2	1.3	2.8	.9	2.1	.02
	90	.4	.3	.4	.5	1.2	2.5	1.3	1.7	1.4	1.9	.3	.4	.4	.1	.3	1.4	2.0	2.5	2.0	.6
	120	—	.4	.4	.5	1.3	1.9	1.4	1.3	1.5	1.3	.6	.4	.3	.2	.3	1.2	2.4	2.3	2.5	.4
	150	.3	.4	.4	.4	1.0	2.1	1.4	1.4	1.5	1.2	.8	.5	.3	.2	.3	1.4	2.1	2.4	2.2	.7
		8-15	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3	8-7		10-3			1-8	2-5	3-11
3-S	(2)	—	.5	.7	3.7	—	3.5	1.1	1.2	—	.9	1.6	1.5	—		—			2.2	1.7	1.4
	15	1.0	.6	—	1.3	1.2	—	—	—	.8	.5	2.7	—	.7		—			—	—	—
	30	.8	.3	—	1.9	1.1	—	—	—	.5	.5	1.0	4.8	8.0		.3			—	—	—
	60	.5	.5	2.0	2.0	1.3	—	—	—	.8	.5	.2	1.0	.9		—			—	—	—
	90	.3	—	—	1.4	.8	—	—	1.2	.8	1.6	—	—	.6		1.3			—	—	—
	120	1.9	3.4	2.2	1.5	.9	—	—	—	—	1.4	1.1	1.0	.004		.5			—	—	—
	150	—	.3	—	—	—	—	—	—	1.2	.4	—	—	—		—			—	—	—

See footnote at end of table.

TABLE 12.—*Chloride in potato processing waste water and in water extracted from soil at various depths. Means of 2 sites —Continued*

Processing plant	Soil depth	Dates in 1974					Dates in 1975						
		8-15	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3
	Cm	*Milliequivalents per liter*											
4-S	([2])	3.7	3.3	2.6	1.9	3.1	2.1	2.6	3.4	2.7	2.1	2.5	2.1
	15	5.4	4.0	—	3.0	2.5	—	—	—	2.2	1.9	2.3	—
	30	13.4	9.0	10.0	3.2	2.8	2.9	3.1	—	1.9	1.9	2.0	—
	60	5.1	12.6	9.5	4.4	3.0	4.3	—	—	3.4	2.4	—	3.4
	90	—	17.6	14.2	—	2.7	—	3.4	—	3.6	—	2.4	1.7
	120	2.2	4.7	—	—	—	—	—	—	—	—	—	—
	150	—	7.3	6.3	9.6	4.2	—	—	—	2.7	2.5	1.7	2.7
		8-15	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8	6-6	7-3
5-F	([2])	—	1.2	1.0	1.1	1.2	1.9	.6	—	2.2	.8	1.3	.5
	15	—	1.2	2.3	.8	—	—	—	1.1	—	.7	—	—
	30	1.3	1.2	1.2	1.0	1.1	2.0	.9	1.1	1.0	.6	—	.9
	60	1.0	.8	.8	.8	.8	1.8	1.1	1.0	1.2	.8	.6	1.8
	90	1.4	1.1	1.0	1.0	—	1.3	—	—	1.0	.6	—	1.7
	120	1.1	.9	1.0	1.0	.9	1.6	.8	.8	1.0	.6	.7	1.0
	150	1.5	1.0	1.1	1.0	.8	1.4	1.0	1.1	1.2	.8	.9	.9

[1] Dashes in columns indicate no data.

[2] Waste water; depth = 0 ft.

TABLE 13.—*Sulfate in potato processing waste water and in water extracted from soil at various depths. Means of 2 sites*[1]

Processing plant	Soil depth	Dates in 1974											Dates in 1975				
		2-15	3-8	4-5	5-3	6-6	7-12	8-8	9-6	10-8	11-1	12-12	1-17	2-7	3-7	4-4	5-8
	Cm	*Milliequivalents per liter*															
1-F	([2])	—	2.2	1.8	3.2	1.4	0.2	—	1.8	0.5	0.6	—	0.6	2.5	1.5	1.6	1.2
	15	—	8.2	—	—	9.4	7.5	—	5.8	—	4.0	5.0	1.6	—	—	—	2.8
	30	2.0	4.7	1.6	3.2	8.5	2.1	0.1	4.0	—	4.7	4.5	1.0	—	1.6	—	—
	60	2.4	.9	—	1.2	7.2	—	—	6.0	—	5.0	1.8	1.3	.6	1.3	1.0	1.3
	90	2.7	1.2	.5	1.0	—	—	2.4	.2	—	—	1.2	—	—	2.1	1.4	—
	120	—	1.3	1.0	1.7	2.6	.3	.04	3.1	2.0	2.8	5.2	—	—	8.0	—	—
	150	21.0	8.6	8.0	5.2	4.6	8.5	.01	6.9	6.7	7.0	7.1	—	1.3	—	—	8.0
		2-15	3-8	4-5	5-3	6-6	7-12	8-15	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8
2-F	([2])	2.4	1.0	2.2	1.6	—	.4	—	1.1	.4	.3	—	1.5	1.7	2.0	1.8	.1
	15	.9	1.0	1.0	2.8	.5	.2	.6	.5	.8	.5	.8	—	—	1.0	1.1	1.5
	30	1.2	1.2	.9	1.8	.5	.2	.6	—	.7	.6	.9	.9	.8	1.0	1.3	—
	60	1.5	1.2	1.1	1.4	.6	.09	.5	.4	.6	.6	1.1	.8	1.0	.7	1.1	1.1
	90	.9	1.1	1.0	1.3	.7	.2	.7	.7	.8	.7	.9	.2	.4	—	1.1	—
	120	1.1	.8	1.0	1.2	.9	.3	—	.9	.9	.8	1.1	.8	.6	.7	.7	.7
	150	—	.8	.9	.7	.6	.2	.6	.7	.8	.7	.8	.8	.9	.9	1.8	1.8
		2-15	3-8	4-5	5-3	6-6	7-12	8-15	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8
3-S	([2])	2.4	2.8	2.4	3.2	—	—	—	.9	.4	2.0	—	.6	3.9	1.8	—	1.5
	15	—	.5	.8	—	—	—	1.3	—	—	1.0	1.2	—	—	—	1.1	1.5
	30	1.0	.9	.7	1.3	1.6	—	1.3	.6	—	1.5	1.0	—	—	—	.01	—
	60	—	.7	.6	—	—	1.3	2.6	.9	1.8	1.6	1.2	—	—	—	—	—
	90	—	—	—	1.3	.6	.8	.6	—	—	1.3	.7	—	—	.1	1.6	1.1
	120	.8	1.3	.8	1.3	.7	.7	1.3	1.7	1.7	1.8	1.4	—	—	—	—	1.2
	150	—	—	—	—	.6	—	—	—	—	—	—	—	—	—	2.7	—

		2-15	3-8	4-5	5-3	6-6	7-12	8-15	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8
4-S	(2)	1.4	1.4	2.1	1.9	—	—	1.3	.4	.4	.8	—	2.4	1.5	1.4	.2	.1
	15	—	—	.7	.5	—	—	2.1	1.2	—	.9	.7	—	—	—	1.6	.4
	30	—	—	.9	.9	1.0	—	3.1	2.4	2.8	1.2	.7	—	.7	—	—	.8
	60	—	—	.9	.9	1.1	—	2.7	3.3	3.1	1.2	.9	—	—	—	—	—
	90	—	—	.8	.6	1.1	—	1.4	2.7	2.6	2.6	.9	1.1	1.0	—	1.1	—
	120	—	—	.7	—	—	—	—	—	—	—	—	—	—	—	—	—
	150	—	—	—	—	1.0	.9	.9	1.1	1.2	2.1	1.6	—	—	—	1.1	—
		2-15	3-8	4-5	5-3	6-6	7-12	8-15	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8
5-F	(2)	1.2	1.8	3.2	2.4	1.2	.2	—	1.7	.5	.6	—	.6	2.5	1.5	1.6	1.2
	15	1.3	.6	—	2.2	—	—	—	2.1	1.9	.9	—	—	—	—	—	1.2
	30	—	.8	1.2	1.3	—	—	1.9	1.6	2.0	2.4	2.1	1.6	1.1	1.4	.8	1.1
	60	1.9	—	1.3	1.1	1.1	—	2.8	2.6	1.5	2.1	2.3	2.3	1.8	1.6	1.3	1.1
	90	1.6	1.8	2.7	2.2	1.7	2.2	.9	1.0	1.0	.8	.8	.9	—	—	—	—
	120	3.0	3.0	2.6	2.4	1.6	2.5	1.4	1.3	1.4	2.5	1.7	1.2	2.5	1.8	1.6	—
	150	1.8	2.1	1.8	2.4	1.9	1.1	1.2	1.3	1.4	1.4	1.5	1.0	1.2	1.7	1.7	1.8

Processing plant	Soil depth	Dates in 1975							Dates in 1976		
		6-6	7-23	8-18	9-19					2-5	
	Cm	Milliequivalents per liter									
1-F	(2)	1.9	0.4	—	—					0.8	
	15	—	—	1.8	—					—	
	30	—	—	1.6	—					—	
	60	5.1	2.7	2.3	2.6					—	
	90	—	—	1.2	—					—	
	120	—	4.4	2.3	—					—	
	150	—	—	—	—					—	
		6-6	7-3	8-7	9-3	10-3	11-7	12-4	1-8	2-5	3-11
2-F	(2)	1.5	.5	.8	1.1	1.1	1.6	—	0.6	.8	—
	15	1.0	.8	.8	.9	.5	.4	.7	.4	.4	0.4
	30	1.1	—	.5	.5	.5	.4	.8	.4	.7	.3
	60	.8	1.0	.3	.7	.5	.5	.5	.5	—	.6
	90	.6	.6	.5	.9	.5	.9	.1	.3	.3	.6
	120	.7	.7	.5	.8	.5	.8	1.2	—	.04	.1
	150	.5	.6	.5	.5	.4	.3	.6	.4	.4	.3
		6-6	7-3		9-3	10-3	11-7		1-8	2-5	3-11
3-S	(2)	1.7	2.0		—	.6	—		1.0	.4	—
	15	1.8	—		—	—	—		—	.7	—
	30	2.0	2.4		—	.6	.8		.2	—	—
	60	—	—		—	—	—		—	—	—
	90	1.6	—		5.1	—	1.1		—	—	—
	120	1.2	.5		—	.6	—		.3	.8	.2
	150	—	—		—	—	—		—	—	—
		6-6	7-3								
4-S	(2)	1.2	.7								
	15	—	—								
	30	1.2	—								
	60	1.2	1.3								
	90	.9	.9								
	120	—	—								
	150	1.0	.8								
		6-6	7-3								
5-F	(2)	1.9	.4								
	15	2.5	—								
	30	—	1.0								
	60	.8	1.6								
	90	.7	.2								
	120	2.2	2.1								
	150	2.2	1.3								

---

[1] Dashes in columns indicate no data.

[2] Waste water; depth = 0 ft.

TABLE 14.—*Bicarbonate in potato processing waste water and in water extracted from soil at various depths. Means of 2 sites*[1]

Processing plant	Soil depth	Dates in 1974												Dates in 1975				
		1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-8	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8
	Cm	*Milliequivalents per liter*																
1-F	(2)	11.4	11.3	9.0	9.8	12.7	14.4	—	10.2	7.9	—	2.4	9.6	—	10.8	7.5	—	8.3
	15	—	—	11.1	—	—	16.3	21.8	—	20.5	—	14.9	13.5	13.4	—	—	—	13.2
	30	14.8	14.0	15.3	10.3	16.3	6.2	15.2	16.8	13.3	—	11.6	11.5	—	—	11.6	—	—
	60	16.5	24.9	21.0	—	—	16.0	—	9.3	15.5	—	16.2	12.6	14.4	14.0	12.2	11.4	13.2
	90	13.6	20.1	13.2	16.4	—	9.2	—	11.5	16.2	—	10.7	13.1	—	—	10.0	11.0	11.5
	120	8.9	—	17.5	26.7	27.2	19.9	7.4	14.5	20.0	16.2	16.1	13.7	18.4	—	11.3	10.9	13.1
	150	8.2	11.7	12.2	—	14.6	11.4	12.1	9.6	12.8	7.7	9.6	8.5	13.4	—	—	—	8.9
		1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-15	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8
2,F	(2)	6.9	7.0	9.0	8.3	6.7	—	4.7	—	5.1	5.3	3.6	5.6	8.4	7.8	13.2	9.7	8.3
	15	—	5.6	8.0	8.8	9.0	—	3.2	1.5	3.6	3.4	1.9	3.0	6.0	—	6.6	6.3	2.5
	30	7.7	9.6	9.2	11.0	9.7	11.5	2.9	1.9	—	3.3	2.0	5.7	7.8	8.1	8.8	8.5	—
	60	7.9	9.8	8.7	10.3	8.6	—	2.8	3.6	5.8	4.0	3.1	6.4	11.8	7.7	—	8.8	—
	90	9.4	10.0	10.0	10.5	9.6	—	2.0	3.2	5.1	3.5	2.4	8.4	10.7	7.8	—	6.0	—
	120	8.6	7.6	10.5	7.3	10.2	—	4.8	—	4.9	3.2	3.8	7.3	10.3	9.3	8.9	7.3	7.8
	150	8.8	8.4	9.6	11.6	10.7	—	2.0	7.4	4.8	2.4	3.5	7.5	9.1	8.7	8.5	9.4	9.3
		1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-15	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8
3-S	(2)	3.8	11.1	—	7.4	5.4	—	—	—	13.5	6.2	5.7	—	5.7	15.7	12.0	—	10.7
	15	—	—	10.4	12.1	—	3.3	—	4.7	5.8	—	13.2	11.7	—	—	—	17.1	9.0
	30	—	—	13.4	13.7	10.8	3.1	—	10.1	8.0	—	11.8	11.4	—	—	—	11.4	—
	60	—	—	—	18.2	—	2.5	6.1	8.0	9.2	10.1	10.9	12.5	—	—	—	13.4	—
	90	—	—	—	—	14.4	3.8	11.3	5.8	—	—	9.2	7.7	—	—	6.3	—	9.5
	120	—	—	—	15.0	23.1	6.1	8.6	8.0	8.0	8.6	9.2	10.0	—	—	—	—	11.2
	150	—	—	—	—	—	5.9	6.6	—	4.5	4.7	—	—	—	—	—	31.4	—
		1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-15	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8
4-S	(2)	6.7	7.5	7.8	8.8	6.7	—	—	7.4	6.2	3.7	.6	9.4	10.2	9.6	7.5	10.2	8.9
	15	—	—	—	—	10.2	—	—	3.1	7.0	—	9.0	5.2	—	—	—	8.8	—
	30	12.2	—	—	10.0	12.1	11.1	—	5.9	7.6	7.2	9.5	7.4	11.6	10.7	—	—	7.0
	60	10.6	—	—	—	10.6	6.9	—	6.1	7.0	7.3	9.5	7.4	—	—	—	—	—
	90	8.7	—	—	6.0	12.2	10.1	7.0	7.4	5.2	6.1	4.3	7.5	13.9	7.0	—	5.4	—
	120	—	—	—	—	—	—	—	—	5.2	—	—	—	—	—	—	—	—
	150	5.6	—	—	14.8	—	3.9	—	4.0	4.6	1.7	3.6	8.7	—	—	—	8.8	—
		1-11	2-15	3-8	4-5	5-3	6-6	7-12	8-15	9-6	10-3	11-1	12-12	1-17	2-7	3-7	4-4	5-8
5-F	(2)	7.0	10.0	12.0	11.6	10.1	7.9	.2	—	10.1	4.3	4.0	10.4	5.0	14.0	5.2	17.7	12.7
	15	—	8.7	9.0	—	7.3	12.4	—	—	6.3	7.4	5.4	—	—	—	—	6.4	6.2
	30	6.8	—	7.5	6.2	10.3	—	—	6.7	6.1	8.1	6.1	10.0	9.1	10.9	10.9	8.4	8.2
	60	—	1.3	—	10.3	10.0	8.5	—	9.7	6.0	9.2	8.5	10.2	13.0	7.9	6.9	9.4	8.3
	90	—	5.7	5.0	8.9	8.0	3.4	6.8	10.8	7.8	7.0	5.1	—	6.7	—	—	—	—
	120	4.7	11.0	8.3	9.2	10.7	9.7	6.2	9.8	9.8	6.5	6.9	8.2	10.3	6.3	7.4	9.2	4.7
	150	12.2	6.7	9.7	17.1	11.6	12.1	8.6	12.1	11.1	7.6	7.5	9.8	14.6	10.1	8.1	8.5	9.4

Processing plant	Soil depth	Dates in 1975							Dates in 1976						
		6-6	7-23	8-18	9-19			12-4			3-11			5-27	
	Cm	*Milliequivalents per liter*													
1-F	([2])	8.0	4.8	6.3	10.9			13.8			5.8			3.9	
	15	—	—	13.1	10.2			—			—			—	
	30	—	—	13.4	—			—			—			—	
	60	11.6	6.6	15.0	15.0			—			—			—	
	90	—	14.4	13.1	—			—			—			—	
	120	—	19.2	18.9	—			—			—			—	
	150	—	12.7	—	—			—			—			—	
		6-6	7-3	8-7	9-3	10-3	11-7	12-4	1-8	2-5	3-11	4-8	5-6	5-27	7-8
2-F	([2])	7.5	8.3	4.8	3.7	6.8	6.4	7.7	8.8	1.6	3.9	3.3	2.8	3.7	5.7
	15	4.2	6.4	4.0	5.4	4.9	7.9	3.5	5.1	—	3.6	2.7	2.1	2.1	5.6
	30	5.1	4.7	4.9	5.7	4.2	7.0	—	—	—	2.2	3.1	2.1	2.0	4.8
	60	4.5	7.5	5.1	4.6	5.5	9.1	3.7	5.4	9.1	3.1	2.9	3.7	2.6	4.0
	90	4.6	6.1	4.5	6.1	4.9	9.6	3.3	8.3	9.7	2.7	3.3	3.0	2.4	4.6
	120	7.3	7.7	5.2	3.5	5.7	8.9	4.4	7.3	6.7	—	—	2.8	3.1	—
	150	7.2	5.7	5.3	3.9	5.7	9.3	4.1	7.6	9.7	1.7	3.0	1.7	2.8	4.4
		6-6	7-3	8-7	9-3	10-3	11-7	12-4	1-8	2-5	3-11	4-8	5-6	5-27	7-8
3-S	([2])	6.3	11.8	—	—	—	—	20.2	9.4	5.1	7.4	6.3	4.6	5.4	18.5
	15	21.0	—	—	—	—	11.6	—	—	—	—	—	4.7	—	—
	30	10.2	14.7	—	10.5	7.3	11.5	—	—	—	—	3.1	—	—	—
	60	8.0	5.7	10.0	5.4	7.9	11.6	—	—	—	—	2.6	—	—	—
	90	—	—	—	7.0	6.8	9.9	—	—	—	—	—	—	—	—
	120	13.2	11.3	—	11.7	9.8	9.8	—	—	—	—	2.8	3.2	—	—
	150	—	12.1	—	—	—	15.7	—	—	—	—	—	—	—	—
		6-6	7-3												
4-S	([2])	5.1	7.9												
	15	10.6	—												
	30	7.0	—												
	60	—	7.8												
	90	11.6	10.8												
	120	—	—												
	150	1.9	3.3												
		6-6	7-3												
5-F	([2])	10.4	8.6												
	15	—	—												
	30	—	13.6												
	60	9.1	8.9												
	90	—	10.8												
	120	8.0	9.2												
	150	10.1	14.1												

---

[1] Dashes in columns indicate no data.

[2] Waste water; depth = 0 ft.

☆ U.S. GOVERNMENT PRINTING OFFICE : 1978 O—264-629