Protecting water for the benefit of wildlife

Fujitsu manufacturing plants use water in various processes such as cleaning of coatings and cooling of equipment. We make every effort to ensure that this water is used as efficiently as possible. At the Nagano Plant, for example, clean water is re-used in manufacturing, while at the Akashi Plant, pure water used in printed circuit assembly production, previously drawn from the municipal water supply, is now supplied from industrial water. Such measures enabled us to limit the total volume of water used at the 15 Fujitsu sites*1 during fiscal 2000 to approximately 19,480,000 tons. Industrial water at the Kawasaki Plant supplies a garden pond that supports a variety of wildlife, including fish and spotbill ducks, creating a "plant in harmony with nature."

*1: The 15 sites are the Kawasaki, Oyama, Nasu, Nagano, Numazu, Kumagaya, Minami-Tama, Akashi, Kanuma, Suzaka, Iwate, Aizuwakamatsu and Mie plants, the Akiruno Technology Center and Fujitsu Laboratories (Atsugi).

Kawasaki Plant (Kawasaki, Kanagawa Prefecture)

Water Quality

Item	National limit	Local govt. limit	In-house limit	Fiscal 2000 actual
Effluent load (m³/day)	—	—	—	86
Hydrogen ion concentration (pH)	5.7~8.7	5.7~8.7	6.0~8.5	6.2~7.8
BOD (biochemical oxygen demand)	300	300	80	12.3
COD (chemical oxygen demand)	—	—	80	61.9
SS (suspended solids)	300	300	50	43.4
Total cyanide	1	1	0.5	Undetected (<0.05)
Hexavalent chromium	0.5	0.5	0.1	Undetected (<0.01)
Total chromium	2	2	0.5	Undetected (<0.06)
Fluorine	15	15	10	6.07

- Levels of the following substances were far below in-house and detection limits: cadmium, lead, arsenic, trichloroethylene, tetrachloroethylene, 1,1,1-trichloroethane, carbon tetrachloride, phenols, copper, zinc, soluble iron, soluble manganese, nitrogen and phosphorus.
- Levels of atmospheric pollution (due to exhaust gases from five boilers) and noise/vibration pollution were far below in-house limits.

Oyama Plant (Oyama, Tochigi Prefecture)

Water Quality

Item	National limit	Local govt. limit	In-house limit	Fiscal 2000 actual
Effluent load (m³/day)	—	—	—	2,417
Hydrogen ion concentration (pH)	5.8~8.6	5.8~8.6	6.0~8.0	6.9~7.6
BOD (biochemical oxygen demand)	160	30	20	7.3
COD (chemical oxygen demand)	160	30	20	10.4
SS (suspended solids)	200	50	30	21
Cadmium	0.1	0.1	0.01	Undetected (<0.005)
Total cyanide	1	1	0.5	Undetected (<0.01)
Total mercury	0.005	0.005	0.0005	Undetected (<0.0005)

- Levels of the following substances were far below in-house and detection limits: organic phosphorus, lead, hexavalent chromium, arsenic, organic mercury, PCB, selenium, benzene, trichloroethylene, tetrachloroethylene, 1,1,1-trichloroethane, carbon tetrachloride, dichloromethane, 1,2-dichloroethane, 1,1,2-trichloroethane, 1,1-dichloroethylene, cis-1,2-dichloroethylene, n-hexane, phenols, copper, zinc, soluble iron, soluble manganese, total chromium, fluorine, nitrogen and phosphorus.
- Levels of atmospheric pollution (due to exhaust gases from a boiler) and noise/vibration pollution were far below in-house limits.

Nasu Plant (Otawara, Tochigi Prefecture)

Water Quality

Item	National limit	Local govt. limit	In-house limit	Fiscal 2000 actual
Effluent load (m³/day)	—	—	—	126
Hydrogen ion concentration (pH)	5.8~8.6	5.8~8.6	6.5~7.5	6.8~7.2
BOD (biochemical oxygen demand)	160	25	6	8.9*2
COD (chemical oxygen demand)	160	25	13	8.5
SS (suspended solids)	200	50	2	1
Nitrogen	120	120	20	5.3
Phosphorus	16	16	8	2.6

- Levels of the following substances were far below in-house and detection limits: cadmium, total cyanide, lead, hexavalent chromium, arsenic, total mercury, organic mercury, PCB, selenium, benzene, trichloroethylene, tetrachloroethylene, 1,1,1-trichloroethane, carbon tetrachloride, dichloromethane, 1,2-dichloroethane, 1,1,2-trichloroethane, 1,1-dichloroethylene, cis-1,2-dichloroethylene, n-hexane, phenols, copper, zinc, soluble iron, soluble manganese, total chromium and fluorine.
- Levels of atmospheric pollution (due to exhaust gases from a boiler) and noise/vibration pollution were far below in-house limits.

*2: Levels exceeded in-house limits due to contamination of the wastewater tanks; the tanks were cleaned.

Notes: • Actual values are recorded maxima, independent of effluent load or pH.
• Effluent load values are averages stated as m³/day.
• pH values express observed ranges in effluent.
• All units except those for effluent load and pH values represent mg/l.

Fujitsu sets in-house limits for air, water, noise and vibration pollution levels at plants and related sites that are stricter than the levels established by law or local ordinance. We strive to prevent pollution through regular measurement, maintenance and management of environmental protection equipment, and we implement remedial measures whenever these in-house limits are exceeded. (Values below the in-house limit and detection limit are not reported in this section.)

Nagano Plant (Nagano, Nagano Prefecture)

Water Quality

Item	National limit	Local govt. limit	In-house limit	Fiscal 2000 actual
Effluent load (m^3/day)	—	—	—	4,500
Hydrogen ion concentration (pH)	5.8~8.6	5.8~8.6	6.0~8.2	6.1~8.0
BOD (biochemical oxygen demand)	160	160	100	65
COD (chemical oxygen demand)	160	—	—	—
SS (suspended solids)	200	200	30	30
Total cyanide	1	0.5	0.1	0.07
Lead	0.1	0.1	0.07	0.06
Copper	3	2	0.7	0.68
Zinc	5	3	0.7	0.38
Soluble iron	10	10	4	1
Soluble manganese	10	10	3	0.15
Total chromium	2	1	0.2	0.1
Fluorine	15	15	7	4.1

- Levels of the following substances were far below in-house and detection limits: cadmium, trichloroethylene, tetrachloroethylene, 1,1,1-trichloroethane, n-hexane, phenols, nitrogen and phosphorus.
- Levels of atmospheric pollution (due to exhaust gases from seven boilers) and noise/vibration pollution were far below in-house limits.

Numazu Plant (Numazu, Shizuoka Prefecture)

Water Quality

Item	National limit	Local govt. limit	In-house limit	Fiscal 2000 actual
Effluent load (m^3/day)	—	—	—	241
Hydrogen ion concentration (pH)	5.8~8.6	5.8~8.6	6.8~7.6	7.3~7.6
BOD (biochemical oxygen demand)	160	160	1.7	1.5
COD (chemical oxygen demand)	160	160	7.6	6.7
SS (suspended solids)	200	200	1	Undetected (<1.0)
Nitrogen	120	120	6.2	4.2
Phosphorus	16	16	2.6	2.4

- Levels of the following substances were far below in-house and detection limits: cadmium, total cyanide, total mercury, lead, arsenic, selenium, benzene, trichloroethylene, tetrachloroethylene, 1,1,1-trichloroethane, carbon tetrachloride, dichloromethane, 1,2-dichloroethane, 1,1,2-trichloroethane, 1,1-dichloroethylene, cis-1,2-dichloroethylene, n-hexane, copper, zinc, soluble iron, soluble manganese, total chromium and fluorine.
- Levels of atmospheric pollution (due to exhaust gases from three boilers) and noise/vibration pollution were far below in-house limits.

Kumagaya Plant (Kumagaya, Saitama Prefecture)

Water Quality

Item	National limit	Local govt. limit	In-house limit	Fiscal 2000 actual
Effluent load (m^3/day)	—	—	—	69
Hydrogen ion concentration (pH)	5.8~8.6	5.8~8.6	6.0~8.5	6.6~7.7
BOD (biochemical oxygen demand)	160	25	6	5.7
COD (chemical oxygen demand)	160	160	20	9.9
SS (suspended solids)	200	60	10	2.9
Nitrogen	120	120	40	34
Phosphorus	16	16	6	7.1*1

- Levels of the following substances were far below in-house and detection limits: cadmium, n-hexane, phenols, copper, zinc, soluble iron, soluble manganese, total chromium and fluorine.
- Levels of atmospheric pollution (due to exhaust gases from four boilers) and noise/vibration pollution were far below in-house limits.

*1: Levels exceeded in-house limits due to bacterial degradation over an extended holiday period; the bacteria were flushed away by dilution after the holiday.

Minami-Tama Plant (Inagi, Tokyo)

Water Quality

Item	National limit	Local govt. limit	In-house limit	Fiscal 2000 actual
Effluent load (m^3/day)	—	—	—	133
Hydrogen ion concentration (pH)	5.0~9.0	5.0~9.0	6.0~8.6	7.6~8.6
BOD (biochemical oxygen demand)	600	600	400	100
COD (chemical oxygen demand)	—	—	—	—
SS (suspended solids)	600	600	300	190
Fluorine	15	15	5	1.1
Nitrogen	150	120	96	120*2
Phosphorus	20	16	12	7.3

Noise

(Units: dB)

Item	Tokyo limit	In-house limit	Fiscal 2000 actual
Daytime	60	55	54
Morning/evening	55	50	54*3
Night	50	45	51*3

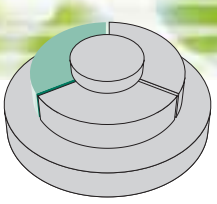
Atomosphere (Boiler 2)

Item	National limit	Tokyo limit	In-house limit	Fiscal 2000 actual
Nitrogen oxide (ppm)	250	120	96	109*4
Sulfer oxide (Nm^3/h)	7.4	7.4	5.9	0.019
Soot/dust/particulate (g/Nm^3)	0.3	0.3	0.24	0.002

- Levels of the following substances were far below in-house and detection limits: cadmium, total cyanide, lead, hexavalent chromium, trichloroethylene, tetrachloroethylene, 1,1,1-trichloroethane, carbon tetrachloride, n-hexane, copper, zinc, soluble iron, soluble manganese and total chromium.
- Levels of atmospheric pollution (due to exhaust gases from two of three boilers) and noise/vibration pollution were far below in-house limits.

*2: Levels exceeded in-house limits due to the use of manual-flush men's toilets; these have since been fitted with automatic sensors.
*3: Levels exceeded in-house limits due to noise created by purification systems; installation of sound-insulation panels is planned.
*4: Levels exceeded in-house limits due to an aging boiler; plans have been made for boiler replacement

Notes:
- Actual values are recorded maxima, independent of effluent load or pH.
- Effluent load values are averages stated as m^3/day.
- pH values express observed ranges in effluent.
- All units except those for effluent load and pH values represent mg/l.



Plant Environmental Control (Water/Air/Noise/Vibration Pollution Data)

Green Factories

Akashi Plant (Akashi, Hyogo Prefecture)

Water Quality

Item	National limit	Local govt. limit	In-house limit	Fiscal 2000 actual
Effluent load (m³/day)	—	—	—	4,483
Hydrogen ion concentration (pH)	5.8~8.6	5.8~8.6	6.2~8.2	7.0~8.1
BOD (biochemical oxygen demand)	160	35	12	25*1
COD (chemical oxygen demand)	160	35	12.1	11.3
SS (suspended solids)	200	50	11.2	10.6
Total cyanide	1	0.7	0.08	Undetected (<0.02)
n-hexane	30	30	16	0.33
Copper	3	3	1	0.31
Soluble iron	10	10	2	0.14
Soluble manganese	10	10	1	0.55
Fluorine	15	15	10	1.5
Nitrogen	120	120	48	10
Phosphorus	16	16	1	0.27

- Levels of the following substances were far below in-house and detection limits: cadmium, organic phosphorus, lead, hexavalent chromium, arsenic, total mercury, organic mercury, PCB, phenols, zinc and total chromium.
- Levels of atmospheric pollution (due to exhaust gases from six boilers) and noise/vibration pollution were far below in-house limits.

*1: Levels exceeded in-house limits due to activated sludge equipment breakdown; the frequency of inspection checks has since been increased.

Kanuma Plant (Kanuma, Tochigi Prefecture)

Water Quality

Item	National limit	Local govt. limit	In-house limit	Fiscal 2000 actual
Effluent load (m³/day)	—	—	—	1,459
Hydrogen ion concentration (pH)	5.8~8.6	5.8~8.6	6.0~8.4	6.4~7.7
BOD (biochemical oxygen demand)	160	25	20	19
COD (chemical oxygen demand)	160	25	20	8.5
SS (suspended solids)	200	50	30	14.7
Copper	3	3	0.7	0.45
Soluble manganese	10	3	1	Undetected (<0.05)
Fluorine	15	8	5	0.5

Noise

(Units: dB)

Item	Tokyo limit	In-house limit	Fiscal 2000 actual
Daytime	75	65	67.2*2
Morning/evening	70	60	69.7*2
Night	60	55	57.5*2

- Levels of the following substances were far below in-house and detection limits: cadmium, total cyanide, lead, hexavalent chromium, total mercury, organic mercury, trichloroethylene, tetrachloroethylene, 1,1,1-trichloroethane, zinc, soluble iron, total chromium, nitrogen and phosphorus.
- Levels of atmospheric pollution (due to exhaust gases from three boilers) and noise/vibration pollution were far below in-house limits.

*2: Levels exceeded in-house limits due to repairment of a dust collector breakdown; the dust collector was repaired and sound-insulation panels were installed (completed March 2000).

Suzaka Plant (Suzaka, Nagano Prefecture)

Water Quality

Item	National limit	Local govt. limit	In-house limit	Fiscal 2000 actual
Effluent load (m³/day)	—	—	—	480
Hydrogen ion concentration (pH)	5.8~8.6	5.8~8.6	6.0~8.0	6.1~7.8
BOD (biochemical oxygen demand)	160	30	24	7.02
COD (chemical oxygen demand)	160	30	24	19
SS (suspended solids)	200	50	19	12.8
Total cyanide	1	0.5	0.35	Undetected (<0.01)
Lead	0.1	0.1	0.05	Undetected (<0.01)
n-hexane	30	30	15	10
Copper	3	2	0.5	Undetected (<0.01)

- Levels of the following substances were far below in-house and detection limits: zinc, soluble iron, fluorine and nitrogen.
- Levels of atmospheric pollution (due to exhaust gases from six boilers) and noise/vibration pollution were far below in-house limits.

Iwate Plant (Isawa, Iwate Prefecture)

Water Quality

Item	National limit	Local govt. limit	In-house limit	Fiscal 2000 actual
Effluent load (m³/day)	—	—	—	12,550
Hydrogen ion concentration (pH)	5.8~8.6	5.8~8.6	5.9~8.5	6.2~7.2
BOD (biochemical oxygen demand)	160	160	25	15.5
COD (chemical oxygen demand)	160	160	30	3.76
SS (suspended solids)	200	200	30	5.8
n-hexane	30	30	30	Undetected (<0.5)
Fluorine	15	15	5	4.62
Nitrogen	120	120	70	27.4
Phosphorus	16	16	5	0.94

- Levels of the following substances were far below in-house and detection limits: cadmium, total cyanide, organic phosphorus, lead, hexavalent chromium, arsenic, trichloroethylene, tetrachloroethylene, 1,1,1-trichloroethane, carbon tetrachloride, copper, zinc, soluble iron, soluble manganese and total chromium.
- Levels of atmospheric pollution (due to exhaust gases from five boilers) and noise/vibration pollution were far below in-house limits.

Notes: • Actual values are recorded maxima, independent of effluent load or pH.
• Effluent load values are averages stated as m³/day.
• pH values express observed ranges in effluent.
• All units except those for effluent load and pH values represent mg/l.

Aizuwakamatsu Plant (Aizuwakamatsu, Fukushima Prefecture)

Water Quality

Item	National limit	Local govt. limit	In-house limit	Fiscal 2000 actual
Effluent load (m^3/day)	—	—	—	7,519
Hydrogen ion concentration (pH)	5.8~8.6	5.8~8.6	6.0~8.0	6.6~7.9
BOD (biochemical oxygen demand)	160	25	16	16
COD (chemical oxygen demand)	160	160	16	7.7
SS (suspended solids)	200	70	20	12
Fluorine	15	10	8	7.9
Nitrogen	120	120	48	28
Phosphorus	16	16	4	3.7

- Levels of the following substances were far below in-house and detection limits: cadmium, total cyanide, organic phosphorus, lead, hexavalent chromium, arsenic, total mercury, organic mercury, PCB, selenium, benzene, trichloroethylene, tetrachloroethylene, 1,1,1-trichloroethane, carbon tetrachloride, dichloromethane, 1,2-dichloroethane, 1,1,2-trichloroethane, 1,1-dichloroethylene, cis-1,2-dichloroethylene, n-hexane, phenols, copper, zinc, soluble iron, soluble manganese and total chromium.
- Levels of atmospheric pollution (due to exhaust gases from a boiler) and noise pollution were far below in-house limits.
- Vibration pollution measurements are not applicable to this site.

Mie Plant (Kuwana, Mie Prefecture)

Water Quality

Item	National limit	Local govt. limit	In-house limit	Fiscal 2000 actual
Effluent load (m^3/day)	—	—	—	10,068
Hydrogen ion concentration (pH)	5.8~8.6	5.8~8.6	6.5~7.5	6.6〜7.0
BOD (biochemical oxygen demand)	160	130	8	3
COD (chemical oxygen demand)	160	130	15	9
SS (suspended solids)	200	130	1	1
Lead	0.1	0.1	0.005	Undetected (<0.005)
Hexavalent chromium	0.5	0.5	0.04	Undetected (<0.005)
Fluorine	15	15	5	3.1
Nitrogen	120	120	35	44.7*1
Phosphorus	16	16	2	0.4

- Levels of the following substances were far below in-house and detection limits: arsenic, n-hexane and copper.
- Levels of atmospheric pollution (due to exhaust gases from three boilers) and noise/vibration pollution were far below in-house limits.

*1: Levels exceeded in-house limits due to cleaning draft equipment breakdown; monitoring by abnormal pharmaceutical volume usage alarm was intensified.

Akiruno Technology Center (Akiruno, Tokyo)

Water Quality

Item	National limit	Local govt. limit	In-house limit	Fiscal 2000 actual
Effluent load (m^3/day)	—	—	—	42
Hydrogen ion concentration (pH)	5.7~8.7	5.7~8.7	5.8~8.6	6.2~8.1
BOD (biochemical oxygen demand)	300	300	270	65.6
COD (chemical oxygen demand)	—	—	150	39.4
SS (suspended solids)	300	300	270	49.5
n-hexane	30	30	30	16.2
Fluorine	15	15	6	1.98
Nitrogen	150	120	100	16
Phosphorus	20	16	12	2.37

- Levels of the following substances were far below in-house and detection limits: phenols and total chromium.
- Levels of atmospheric pollution (due to exhaust gases from a boiler) and noise/vibration pollution were far below in-house limits.

Fujitsu Laboratories (Atsugi) (Kanagawa Prefecture)

Water Quality

Item	National limit	Local govt. limit	In-house limit	Fiscal 2000 actual
Effluent load (m^3/day)	—	—	—	448
Hydrogen ion concentration (pH)	5.0〜9.0	5.5〜8.7	6.0〜8.6	6.7〜8.7
BOD (biochemical oxygen demand)	600	600	80	37
COD (chemical oxygen demand)	—	—	80	18
SS (suspended solids)	600	600	50	10
Lead	0.1	0.1	0.05	0.03
n-hexane	30	30	15	8.9
Copper	3	3	1	0.18
Zinc	5	3	1	0.98
Soluble iron	10	10	2	0.97
Soluble manganese	10	1	0.8	0.07
Total chromium	2	2	0.5	Undetected (<0.05)
Fluorine	15	15	10	9.9

- Levels of the following substances were far below in-house and detection limits: cadmium, total cyanide, hexavalent chromium, arsenic, total mercury, selenium, benzene, trichloroethylene, tetrachloroethylene, 1,1,1-trichloroethane, carbon tetrachloride, dichloromethane, 1,2-dichloroethane, 1,1,2-trichloroethane, 1,1-dichloroethylene, cis-1,2-dichloroethylene, phenols, nitrogen and phosphorus.
- Levels of atmospheric pollution (due to exhaust gases from eight boilers) and noise/vibration pollution were far below in-house limits.

Notes: • Actual values are recorded maxima, independent of effluent load or pH.
• Effluent load values are averages stated as m^3/day.
• pH values express observed ranges in effluent.
• All units except those for effluent load and pH values represent mg/l.