



SERVICIOS AMBIENTALES Y
GEOGRÁFICOS S.A.

SPECIALIZED
SERVICES

HYDRAULIC INFRASTRUCTURE

SAG S.A. has participated in several studies related to water resources, from initial identification of the study, during design development phase, thru the work supervision and environmental management of the operation phase.



The Company has been involved during the construction and operation of the water resources studies throughout the environmental work supervision of the hydraulic works on industrial, mining and energy sectors.



Environmental work supervision during the construction of small hydroelectric power plants.

Some of the services that are offered include:

- Environmental work supervision during the construction of hydroelectric power plants in the following infrastructure: diversion dam, water intake structures, sand filters, covering structures, conduction tunnel systems, powerhouse and discharge structures.
- Environmental work supervision during the construction of aqueduct systems.
- Environmental impact study for the construction of the wastewater treatment plant at the Bello municipality.
- Hydrogeological studies.



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SPECIALIZED SERVICES



HYDRAULIC INFRASTRUCTURE



Water quality model: Streeter – Phelps platform.

- Studies for the design and construction of hydraulic dams.
- Hydrological and hydraulic studies for drainage infrastructure.
- Hydrological modeling of surface water discharge and sediment transport.
- Risk and vulnerability analysis of aquifer systems.
- Risk management plan for discharges.
- Water intake and discharge permits procedures.

The mentioned services have been executed to companies such as ARGOS, EPM, ISAGEN, ISA, HMV Ingenieros, Escuela de Ingeniería de Antioquia.

MONITOREO PARA LA CARACTERIZACIÓN DE AGUAS RESIDUALES														
Cliente		epm		Representante cliente		Juan								
Proyecto		Porce II		Sist. septico		Casa de Máquinas								
Muestreo	7	T. Inicio	24	Fecha	01-abr-15		X:	6,35689						
Colector	oscar ossa	T. Final	22,58	Volumen a componer	2000		Y:	75,2569						
ENTRADA			SALIDA			OBSERVACIONES								
N	Ref	Hora H:M	Vol.1 mL	Temp.1 M: S	Vol.2 mL	Temp.2 M: S	V Pro mL	T Pro M: S	Q Pro mL/S	V Ail. cuota	Q Pro L/S	pH	Temp.	CE
1		07:00	100	15,47	80	15,52	90	15,5	5,8	28	0,008	8,24	25,3	1088
2		07:30	350	10,31	300	10,56	325	10,44	31,1	152	0,031	8,52	26,1	580
3		08:00	170	15,5	150	15,4	160	15,45	10,4	50	0,010	8,27	26,5	605
4		08:30	290	15,44	260	15,45	275	15,45	17,8	87	0,018	7,63	27,3	324
5		09:00	800	10,41	590	10,56	695	10,49	66,3	323	0,068	8,44	28,4	727
6		09:30	240	15,44	220	15,56	230	15,5	14,8	72	0,015	8,68	27,3	299
7		10:00	50	15,4	60	15,44	55	15,42	3,6	17	0,004	7,79	26,8	854
8		10:30	380	15,25	920	15,27	650	15,26	42,6	208	0,043	8,55	27,6	780
9		11:00	940	8,53	960	9,31	950	8,92	106,6	519	0,107	7,85	27,8	271
10		11:30	220	15,5	140	15,51	180	15,51	11,6	57	0,012	8,32	27,9	725
11		12:00	320	15,41	230	15,34	275	15,38	17,9	87	0,018	6,81	27,4	720
12		12:30	700	15,4	650	15,31	625	15,36	40,7	198	0,041	8,49	28,3	717
13		13:00	680	14,29	480	13,9	580	14,1	41,1	201	0,041	8,5	29	619
Máximo: A							Q promedio: 31,56 2000 A						0,107 8,68 29,00 1,088	
Mínimo: V													V 0,004 6,81 25,30 271	

Modelo de Calidad de Agua: Steeter - Phelps	
Proyecto: Argos: Actualización de permisos de vertimientos	
ID Corriente:	Quebrada Malena
ID Vertimiento (s):	Pozo Séptico
Coordenadas del Punto de Vertimiento	Magna Sirgas Bogota: 3116
Este:	961519.25
Norte:	1208801.97
Fecha:	2/13/2015

Datos Corriente Principal		Constantes del Modelo	
Q ₀	0.586 m ³ /s	theta_d	1.047
OD ₀	6.89 mg/L	theta_a	1.024
DBO ₀	2.49 mg/L	U	0.062607 m/s
T ₀	31.3 °C		

Datos del Vertimiento		Condiciones Iniciales del Modelo	
Q _v	4.20E-06 m ³ /s	Q ₀	0.586 m ³ /s
OD _v	0 mg/L	OD ₀	6.889951 mg/L
DBO _v	1927 mg/L	DBO ₀	2.503793 mg/L
T _v	32.3 °C	T ₀	31.30001 °C
		OD _v	8.987 mg/L
		D _v	2.097049 mg/L

Datos del Punto de Mezcla		Resultados Modelo de Calidad	
H	0.78 m	Déficit Crítico	2.10 mg/L
W	12 m	OD Crítico	6.89 mg/L
vs	0.120695 m/d	Tiempo Crítico	0.00 d
Kd ₂₀	0.059639 t/d	Distancia Crítica	0.00 m
Tramo	500 m		

Constantes Cinéticas	
Kd ₁	0.100 t/d
Ka ₁	1.866 t/d
Ks	0.155 t/d

De acuerdo a los resultados obtenidos, los vertimientos de aguas residuales realizados sobre la corriente principal, No genera efectos adversos sobre la calidad del recurso hídrico, al considerar el nivel mínimo de oxígeno 6.89 mg/L alcanzado en el sistema

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