Dam safety Bi

Circular 4 /2013 (Dam Safety)

Dam Safety Branch
Irrigation Department
Colombo 7

28 March 2013

Director of Irrigation (.....)
Additional Irrigation Engineer (.....)

Sub: Safety of Head Works - Conducting Regular inspections and Reporting procedure

Ensuring the safety of all the type of irrigation head works is a vital responsibility of Irrigation Department. The head works of all the schemes (Storage, Diversion, Lift Irrigation, SWE & Drainage Schemes) should be inspected by the field officers regularly to detect undesired developments in these structures. Taking care of dams and appurtenant structures, whether it is a small dam or a large dam is specially emphasized always to prevent or mitigate any hazardous event to ensure safety of lives and properties in downstream of the reservoirs.

This circular guides on regular inspection of head works by responsible officers, recording the status and reporting to head office, emphasizing the importance of each activity. Dam Safety circular 15/98 dated 10th July 1998 is superseded with this circular and all the relevant officers are advised to adhere to the instructions given below with regards to safety of head works.

1.0 General

At present Irrigation Department is responsible for operation and maintenance of 336 Gravity Schemes. Out of above, 232 are reservoir schemes of which 82 schemes are formed by large dams. It is necessary to carryout inspection of these headworks by the responsible officers periodically as mentioned in section 3 and report as guided in section 4 of this circular.

Allocating the annual funds for [illegible] safety, continuous records on [illegible] by the Dam Safety Division for [illegible] regular inspection will provide facts for progressive development of defects in head works which would be useful for the dam safety experts to conclude the causes of defects and frame the remedial measures.

In the emergency response to a sudden safety issue faced, it is needed to benefit from this regular process to identify problem after inspection and report to Dam Safety Division immediately. It will make easy to coordinate with specialized Branches for their advice and allocate the funds to undertake remedial measures without delay.

According to the Irrigation Ordinance, Irrigation Department is responsi[illegible] to ensure safety of minor schemes too, even if those are not under purv[illegible] of the department, if those are threat to the safety of a Major/Med[illegible] scheme, during hazardous event. Hence DII and DIEE are instructed [illegible] coordinate with Provincial Councils and Agrarian Services Department wh[illegible] and when necessary to carry out safety inspections along with the offic[illegible] of these organizations.

A list of Major/Medium Reservoir irrigation schemes in yo[illegible] District/Province and sample forms for monthly, quarterly and seaso[illegible] inspection reports are attached herewith.

2.0 Categorization of Schemes

For the purpose of safety review, Irrigation schemes are catego[illegible] two types, namely major and medium schemes.(Please see annex 3[illegible] for the definitions are as follows.

2.1 Major Irrigation Schemes

Major Irrigation Scheme is defined as a scheme of[illegible]

(a) a reservoir having capacity more than 25 MCM (20,000A[illegible] or

(b) a reservoir impounded by a large dam as cla[illegible] ICOLD viz;

- All the Dams not less than 15m in height [illegible] from the lowest point or
- A dam between 5m and 15m in height impoun[illegible] storage

(c) having irrigation command area more than 810ha (2[illegible] or

(d) rating as "Highly Hazardous" depending on the [illegible] age / peculiarity of structure /foundation.

The schemes falling under above category in your District [illegible] are identified in Annex 3 based on the information availab[illegible] Office. You are free to add any scheme to [illegible] inspection repo[illegible] you feel tha[illegible] current condition [illegible] if any scheme [illegible] the high prio[illegible] should [illegible]

2.2 Medium Irrigation Schemes

All other schemes [illegible] the pu[illegible] not fall into above category.

3.0 Regular inspection [illegible]

The head works of all the Major/Medium [illegible] diversion schemes) should be inspected b[illegible] per the following sched[illegible]

Table 3.1.2 Frequency of measurement

Reservoir water level	Instrument type	Frequency of measure
Above FSL	Water Level Gauge	hourly
All Reservoir water level	Water Level Gauge	daily
More than 75% full	All piezometers	daily
Above MOL	All piezometers	Weekly
More than 75% full	V -notch weirs	daily
Above MOL	V -notch weirs	Weekly
	Level monuments	yearly

3.2 Inspection of medium Irrigation Schemes

Frequency of inspection and delegated authority on medium irrigation schemes are given in the table below.

Table 3.2.1 Frequency of Inspection of Medium Irrigation schemes

Inspection type	Responsible officer	Responsibility	Inspection Fre
Visual inspection	Engineering Assistant	Inspection of entire dam and appurtenants, Structures, hydro mechanical equipments	Fortnight Work Supervi Thakshan (Field A during rainy se
Visual inspection	Divisional Irrigation Engineer	Inspection of entire dam and appurtenants, Structures, hydro mechanical equipments	Once in month rainy season
Visual inspection and testing as per the Guideline	Chief Engineer (Mechanical)	Inspection of hydro Mechanical work	Twice a specially rainy season

3.3 Monitoring Mechanism

CE in consultation with DI should prepare an annual inspection cover all Major/Medium Irrigation schemes in the District send to Dam Safety Branch for information.

Check lists to be maintained at DIE's office and DI's office timely delivery of monthly and quarterly reports as relevant. Office will also circulate a progress report after the de quarterly inspection report is due.

The inspection by Engineering Assistant & Work Supervisor/T Sahayaka /Field Assistant should be mentioned in their W.P.RR. of special interest should be brought to the notice of

3.1 Inspection of Major Irrigation Schemes

Frequency of inspection, delegated authority and responsibility on major irrigation schemes are given in the table below.

Table 3.1.1 Frequency of Inspection of Major Irrigation schemes

Inspection type	Responsible officer	Responsibility	Inspection frequency
Visual inspection	Work Supervisor/ Thakshanika Sahayaka (Field Assistant)	• Inspection of entire dam and appurtenants, Structures, hydro mechanical equipments	weekly
Visual inspection and instrumentation monitoring	Engineering Assistant	• Inspection of entire dam and appurtenants, Structures, hydro mechanical equipments	Fortnight during dry season Weekly during rainy season and more frequently as required in critical sections.
		• Taking readings of seepage and piezometers. Checking levelling monuments.	As per table 3.1.2
Visual inspection and instrumentation monitoring	Divisional Irrigation Engineer	• Inspection of entire dam and appurtenants, Structures, hydro mechanical equipments	Once in month during rainy season Fortnight or weekly during rainy season in critical sections.
		• Monitoring of observations of instruments.	Ensure measurements as per table 3.1.2
		• Study and analyze the records	Once in month and when abnormalities are reported
Visual inspection and monitoring as per guideline	Director (Mechanical)/ Chief Engineer (Mechanical)	Inspection of hydro mechanical work	Twice a year specially before rainy season
Inspection	Director of Irrigation / Chief Engineer	General inspection of entire dam with respect to maintenance and operational aspects	Each scheme at least twice a year before every rainy season and any emergency situation
Safety evaluation of dam	Panel of experts appointed by Director (Asset Management)	Comprehensive inspection of the dam and entire area according to procedure given in SEED Manual. Report on status of dam with respect to safety and recommend any improvements.	Once in five years

supervising officer without awaiting the submission of reports under the section 4.0

4.0 Documentation and Reporting

Monthly & quarterly Inspection reports of each Major/Medium scheme including analysis of instrumental data should be filed scheme wise in separate files. These files must be available in DIE's office at any time for reference by inspection officers from Head office and District office.

4.1 Monthly Reports

(to be filled by EA and kept at DIE's office)

A specimen format for monthly inspection report is attached herewith (Annex 1). It is the responsibility of EA in-charge of head works to report the condition of head works in Major/Medium Schemes including analysis of Instrumental data, monthly for DIE's endorsement.

You may reproduce this form for your requirement by duplication or photocopying the same, but it should not be changed in any manner. Important observations with regard to any possible improvements to the format would be brought to the notice of CE (Dam Safety) promptly.

4.2 Quarterly Reports

(to be filled by EA ,checked by DIE and

- Major scheme reports to be sent to CE (DS) with copy to DI (District)
- Medium scheme reports to be sent to DI (District) only.)

A specimen format for a Quarterly Inspection Report is attached herewith (annex 2). Using this format DIE should develop a scheme specific report format incorporating only the relevant sections. For example if there are no gates in spillway, section 4.2 can be deleted. The scheme specific form should be sent to CE (Dam Safety) for scrutiny.

Duly completed report should be received by Dam Safety office at the end of each quarter. (1st quarter report before 15th April, 2nd before 15th July, 3rd before 15th October and 4th before 15th January of the following year) on Major schemes given in annex [illegible]. This report should be sent directly to CE (Dam Safety) by DIE with copies to DI.

Quarterly report for medium schemes should be sent to DI by DIE at the end of each quarter before the dates mentioned as above.

4.3 Seasonal Report

[two reports per year to be filled by CE (District office) & to be sent to CE (DS)]

Seasonal report submit by DI/CE should include a summary of defects identified during inspection and proposed remedial action for all Major/Medium schemes. The specimen format is given in annex 4.

This seasonal inspection report prepared by CE (District office) should be sent to Dam Safety Branch with the endorsement of DI at the end of March and September in each year. Director (AM)/CE (Dam Safety) too will join some of the inspection programs once the inspection program is informed in advance.

4.4 Special report on Hydro-Mechanical Instruments

Hydro mechanical work of each Head works to be inspected by Director (Mechanical)/ Chief Engineer (Mechanical) twice a year as per table 3.1.1 and table 3.2.1. Chief Engineer (Mechanical) should prepare an annual inspection schedule to cover up all Major/Medium Irrigation schemes in consultation with relevant District Directors and send to Dam Safety Branch. The inspection reports prepared by Chief Engineer (Mechanical)should be sent to Director (AM) with the endorsement of Director (Mechanical) with copies to relevant District Directors.

The guideline for inspection will be issued by Director Mechanical (Head quarters & Southern).

4.5 Instrumental readings and analysis

Specimen data sheets to record readings of Piezometers and V-notches are attached herewith (Annex 5 and Annex 6). Two separate registers for piezometers and v notches in all the schemes of the division should be maintained at DIE's office.

Please make available copies of this circular to all the EAA, WSS, [illegible] the Divisions and instruct them to inspect and submit information accordingly. Soft copy of this circular is already sent to you. Please feel free to contact Chief Engineer (Dam Safety) at any moment if you need further clarifications and more details.

Eng. Badra Kamaladasa
Director General of Irrigation

Copies :-

1). Addl. DGI (I&WM) / (RD&C) / (PD&SS) -For monitor... Programme p...

2). Zonal Director (Southern /Uva/Central /North Central/North) -For Information and Guidance ... field staff p...

3).Director Mechanical(Head quarters & southern /central/North central)/ CE(Mechanical) -To carry out ... Inspection ... para4.4 and ... up action pl...

4.0 PUMP (Lift Irrigation & Flood Protection Scheme)
4.1 Operability of Pumps
4.2 Problems at Intake
4.3 Any problems at delivery end?
5.0 Inlet Works
5.1 Condition of structures
5.2 Condition of Inlet channel
6.0 Condition of Gated structure in SWE scheme
7.0 Encroachments or any other unauthorized interference
8.0 Any other Information
Signature of Officer Reporting Name & Designation Date :

Annex -1

MONTHLY INSPECTION REPORT ON CONDITION OF HEAD WORKS

FOR THE MONTH OF ..... OF ..... SCHEME

(This form should be filled by EA and to be kept at DIE's Office w.r.t. all schemes managed by ID)

i) Scheme **ii) Type** :- Storage/Diversion/Lift/SWE/Drainage

iii) Name & Designation of Inspecting Officer

iv) Date of Inspection

I BUND (STORAGE/DIVERSION/SWE/DRAINAGE SCHEMES)

1.1 Vegetative growth

1.2 Runnels

1.3 Settlements

1.4 Slips

1.5 Cracks

1.6 Unusual Seepage

1.7 Condition of Toe Drains

1.8 D/S slope Protection

1.9 Rip - Rap

1.10 Any Special detection of bund

II SLUICE

2.1 Operability

2.2 Lubrication done recently?

2.3 Unusual leaks?

2.4 Condition of Gates

2.5 Condition of Tower

2.6 Condition of D/S abutment

2.7 Any other special detection of sluice

III SPILL WAYS

3.1 Abutments

3.2 Condition of Concrete Masonry Structure

3.3 Operability of Radial gates

3.4 Wire ropes

3.5 Lubrication

3.6 Condition of gates

3.7 D/S condition

3.8 Any other special detection of spillways

2.3	Downstream Slope (1 on)				
		Y	N	NA	REMARK
2.3.1	Cracking				
	a) Longitudinal				
	b) Transverse				
2.3.2	Slips or signs of slips				
2.3.3	Bulging				
2.3.4	Settlements				
2.3.5	Gullies formed by erosion				
2.3.6	Damp areas / Signs of seepage				
2.3.7	Seepage or Wet areas				
2.3.8	Boils (if present)				
2.3.9	Animal burrows (ant hills / rat holes)				
2.3.10	Areas damaged by animals				
2.3.11	Slope protection in good condition ?				
2.3.12	Vegetation within 50' beyond toe (Heavy / Medium / Light)				
2.3.13	Encroachments				
3.0	**DRAINAGE & SEEPAGE CONTROL**				
		Y	N	NA	REMARKS
3.1	Toe filter in good condition				
3.2	Toe drain choked with vegetation / silt				
3.3	Drainage outlets choked?				
3.4	Flow of water through drainage outlet				
3.5	Condition of Berm				
3.6	Others				
4.0	**SPILL WAY**				
	(Nos. Radial Gates / Nos. Square Steel Gates / Nos. Vertical Gates / ..... Section				
4.1	**GENERAL**				
		Y	N	NA	REMARKS
4.1.1	Structure				
4.1.2	Concrete / masonry section (Cracking / Erosion / Scaling / Exposed reinforcement / Settlements /Movements)				
4.1.3	Leakage through structures				
4.1.4	Crest				
	a) Surface Condition is good				
	b) General condition of concrete is good				
	c) Cracks or areas of distress				
	d) Any signs of movements				
4.1.5	Spillway slabs (Up lift, cracking, subsidence)				
4.1.6	Stilling basin in good condition				
4.1.7	Apporach Channel (Obstructed by debris, Silting, Growth of vegetation)				
4.1.8	Tail Channel (Obstructed by debris, Silting, Growth of vegetation, any human constructions, Encroachment)				

Annex 02

QUARTERLY INSPECTION REPORT ON CONDITIONS OF HEAD WORKS

(Speciman format)

..... **Scheme**

For the 1st / 2nd / 3rd / 4th Quarter of .....

IMPORTANT : All remarks regarding deficiencies should include chainage location and indicate whether this was reported earlier.

This form should be filled by EA checked by DIE and

* Major scheme reports to be sent to CE (DS) with copy to DI (District)
* Medium scheme reports to be sent to DI (District) only

Inspecting Officer : Date of Inspection :

Name & Designation :

Name of the E.A. responsible for maintenance of Head Works

1.0	**GENERAL**		
1.1	Name of Head Works :		
1.4	Division :	Co-ordinates :	
1.5	F.S.L. :	Capacity at FSL :	
1.6	Name of River Basin :	HFL :	
1.7	Reservoir Water Level on day of Inspection :	Irrigable Area :	
2.0	**BUND (Inspection of up stream slope, Bund Crest and Down stream slope)**		
	Length :		
	Maximum Height :		
	BTL :		
2.1	**Upstream Slope (1 on)**		

		Y	N	NA	REMARKS
2.1.1	Deficiencies in Rip-rap				
2.1.2	Other areas eroded by wave action				
2.1.3	Gullies formed due to rain				
2.1.4	Cracking				
	a) Longitudinal				
	b) Transverse				
2.1.5	Slips or signs of slips				
2.1.6	Vegetation (Heavy / Medium / Light)				
2.1.7	Burrows				
2.2	**BUND CREST (Average Width -)**				

		Y	N	NA	REMARKS
2.2.1	Cracking				
	a) Longitudinal				
	b) Transverse				
2.2.2	Depressions				
2.2.3	Internal Movements				
2.2.4	Condition of Level blocks is good				
2.2.5	Condition of chainage pegs is good				
2.2.6	Pot holes				
2.2.7	Condition of Road (Tarred / Gravelled) is good?				
2.2.8	Other Defects				

8.0	**PIEZOMETERS**				
		Y	N	NA	REM
8.1	Condition is good				
8.2	Whether readings taken regularly				
8.3	Any abnormal observation				
8.4	Whether dip meters are working				
9.0	**LEVEL BLOCKS**				
9.1	Condition is good				
9.2	Whether readings taken yearly				
9.3	Any abnormal observation				
10.0	**V - notch**				
10.1	Condition is good				
10.2	Whether readings taken regularly				
10.3	Any abnormal observation				
11.0	**RECENT REPAIR / REMEDIAL WORK HEAD WORKS**				
11.1	Detail of recent repair / remedial work to Head works				
11.2	Any other defects observed to Head works after repairs done as given in 11.1				
12.0	No. of O & M labourers working on head works	Ad hoc	Reg Casual	Permenant	
12.1	Exclusively for H/W :				
12.2	Attending to water management as well :				
13.0	Unauthorized encroachments on bund reservation and / or interference with head works please give details or No. of encroachers and from when (Fisherman / Wild life reserve etc..)				
14.0	Any matter requiring more detail comments				
15.0	Items for Immediate attention :				
16.0	**INSPECTION DATES DURING THIS QUARTER**				
16.1	Inspected by E.A. on following dates :				
16.2	Inspected by D.I.E. on following dates :				
16.3	Inspected by D.I.(District/Province) on following dates :				
16.4	Reports on following inspection are filed in my office :				
	a) Inspection by E.A. on :				
	b) Inspection by D.I.E. on :				
	c) Inspection by D.I. (District/Province) on :				

Personnel attention of C.E. (Dam Safety)

Director (AM)

I personnaly inspected the Head Work of ..... Scheme and I certify that the dat provided above are true to my knowledge.

Signature :

Name :

Date :

Copy to : DI ..... Province/District

Condition of Abutments				
a) Erosion				
b) Differential movement				
c) Cracks or areas of distress				
d) Seepage				
e) Slides				
f) Condition of backfill				
g) Seepage along back of abutment				

GATED SPILLWAYS

	Y	N	NA	REMARKS
Condition of gates (Broken / Bent / Corroded / Rusted)				
When shut any leakage				
Hoisting arrangement in good condition				
Operability of gates satifactory				
Operability by Electrically is good				
Condition of Electric supply is good				
Condition of Motor is good				
Whether Lubrication / grease applied				
Last date of on which lubricated / greased				

SLUICE	LB	RB	REMARKS
Type			
Size			
Chainage			
Condition of control gate			
Condition of emergency gates (Bulk head)			
Condition of Trash rack (Trash rack is choked by debris)			
Condition of gate operating mechanism			
Leakage observed form inner surface of barrel after shutting			
Leakage through gates after shutting			
Seepage around the barrel & head wall			
Condition of sluice outlet & d/s cushion			
Condition of access to sluice			
Cracks on the structure			
Settlement			
Condition of main channel up to 100ft (Obstructed by debris / Silting / Vegetation)			
Very slight change was observed at the pier section			

RESERVOIR BED & PERIPHERY CHANNEL / STRUCTURE

	Y	N	NA	REMARKS
Condition of Inlet Channel is good				
Condition of Inlet structure is good				
Encroachments or any other obstructions				

WATER LEVEL GAUGE / OTHERS	Y	N	NA	REMARKS
Whether clearly readable ?				
Whether readings taken regularly				
Condition of Gauge is good?				

No	Reservoir Scheme	District	Capacity	Maximum Dam height	Irrigable Area	Ca
			MCM	m	ha	
62	Maha Horuwila	Anuradhapura			81	Me
63	Maha Mankadawala	Anuradhapura	2.5	2.0	170	Me
64	Maha Mankadawala -Kekirawa	Anuradhapura	1.7		148	Me
65	Maha wewalkada	Anuradhapura	1.5	1.5	101	Me
66	Mahadivul wewa	Anuradhapura	0.7		113	Me
67	Mahakiulekada wewa	Anuradhapura	1.5	1.5	81	Me
68	Mahalinda wewa	Anuradhapura	1.6	1.7	173	Me
69	Maminiyawa	Anuradhapura	2.5	8.0	188	Me
70	Manewa wewa	Anuradhapura	0.8	1.5	97	Me
71	Maningamuwa	Anuradhapura	1.1	1.4	85	Me
72	Mankadawala	Anuradhapura	1.5		98	Me
73	Maradanmaduwa	Anuradhapura	1.3	1.5	89	Me
74	Medawachchiya	Anuradhapura	1.5	1.9	81	Me
75	Moragaha digiliya	Anuradhapura			85	Me
76	Muslim Etaweerawewa	Anuradhapura			162	Me
77	Muslim walahawiddawewa	Anuradhapura	0.5		92	Me
78	Muwategama	Anuradhapura	1.0	4.6	104	Me
79	Panderellawa wewa	Anuradhapura			109	Me
80	Parangiya wadiya	Anuradhapura	1.7	1.8	142	Me
81	Periyakulama	Anuradhapura	1.7	3.3	81	Me
82	Pethiyannekada	Anuradhapura	1.2	1.2	101	Me
83	Pihibiyagollewa	Anuradhapura	1.2	4.3	113	Me
84	Ralapanawa	Anuradhapura	1.5	1.5	122	Me
85	Ranpathwila wewa	Anuradhapura	1.0	1.8	105	Me
86	Rasnaka wewa	Anuradhapura			182	Me
87	Serunewa	Anuradhapura	0.8	1.5	81	Me
88	Sihala walahawidda wewa	Anuradhapura			168	Me
89	Thalagaha wewa	Anuradhapura	0.5	1.2	87	Me
90	Thambalagollewa	Anuradhapura	0.6	4.2	85	Me
91	Thannayankulama	Anuradhapura	0.6	3.7	81	Me
92	Thawalan Halmiile wewa	Anuradhapura	1.4		101	Me
93	Thiththagonnewa	Anuradhapura	1.9	4.0	81	Me
94	Thuruwilawewa	Anuradhapura	6.4		188	Me
95	Uttimaduwa	Anuradhapura	1.6	5.0	85	Me
96	Wadigawewa	Anuradhapura			142	Me
97	Wagollakada wewa	Anuradhapura			146	Me
98	Wahagahapu wewa	Anuradhapura			81	Me
99	Waththe wewa	Anuradhapura	0.8	4.3	84	Me
100	Welimuwa pothana	Anuradhapura			101	Me
101	Weruppankulama	Anuradhapura	0.8	4.3	111	Me
102	Ambewela	Badulla	2.1	17.5	405	Major
103	Dambarawa	Badulla	5.9	13.0	808	Major
104	Dehigama	Badulla	2.0	30.0	122	Major
105	Demodara	Badulla	2.0	18.0	182	Major
106	Mapakada	Badulla	9.5	10.1		
107	Nagadeepa	Badulla	33.6	32.0		
108	Sorabora	Badulla	20.7	10.0		
109	Bomburella	Badulla	1.3	12.2		
110	Kande Ela	Badulla	2.3	12.8		
111	Kaddumurivu	Batticaloa	5.5	5.0		
112	Kitul Wewa	Batticaloa	5.2	5.1		
113	Navakiri	Batticaloa	59.8	16.0		
114	Rugam	Batticaloa	22.9	17.0		
115	Unnichchai	Batticaloa	51.2	15.0		
116	Vakaneri	Batticaloa	16.6	16.0	3,605	Major
117	Wadamunai	Batticaloa	5.2	5.8	153	Major
118	Thumpankerny	Batticaloa	0.8	6.7	271	Medium
119	Weligahakandiya Kulam	Batticaloa	2.1	6.9	137	Medium
120	Boralasgamuwa	Colombo	0.0	3.0	94	Medium
121	Thalangama	Colombo	0.0	3.0	83	Medium
122	Wewelanda	Rathnapura			354	Medium
123	Uyanwatta	Kaluthara	0.5	5.8	355	Medium
124	Denagama Tank	Matara	1.0	16.0	343	Major
125	Ellawela	Matara	1.0	15.0	547	Major
126	Hali Ela	Matara	3.8	15.0	100	Major

Major/ Medium Reservoir Schemes

Reservoir Scheme	District	Capacity MCM	Maximum Dam height m	Irrigable Area ha	Category
[illegible]mbalanoya	Ampara	43.4	12.5	1,831	Major
[illegible]kgal Oya	Ampara	29.0	15.0	992	Major
[illegible]amal Oya	Ampara	46.2	15.0	1,499	Major
[illegible]allan Oya -Jayanthi Wewa	Ampara	117.2	20.0	1,418	Major
[illegible]amalgama	Ampara	25.5	21.0	1,094	Major
[illegible]ttikulam	Ampara	6.3	6.4	689	Major
[illegible]nanayaka Samudraya	Ampara	947.1	33.0	43,814	Major
[illegible]alugala Tank	Ampara	3.3	3.7	263	Medium
[illegible]nama	Ampara	3.3		304	Medium
[illegible]adella Tank	Ampara	2.5	4.5	243	Medium
[illegible]empitiya	Ampara	2.1	5.5	182	Medium
[illegible]alathapitiya	Ampara	2.6	5.0	283	Medium
[illegible]aya Wewa	Anuradhapura	2.2	15.0	156	Major
[illegible]uruluwewa	Anuradhapura	67.8	15.0	4,212	Major
[illegible]ahakandarawa	Anuradhapura	47.7	17.0	2,527	Major
[illegible]ahawilachchiya	Anuradhapura	40.1	15.0	1,094	Major
[illegible]ankattiya	Anuradhapura	10.5	9.1	608	Major
[illegible]choladuwa	Anuradhapura	56.7	17.0	2,541	Major
[illegible]wara Wewa	Anuradhapura	44.5	15.0	1,013	Major
[illegible]daviya	Anuradhapura	104.8	18.0	5,589	Major
[illegible]jangana	Anuradhapura	100.6	22.0	7,493	Major
[illegible]gilikandarawa	Anuradhapura	3.9	6.1	263	Major
[illegible] Wewa	Anuradhapura	4.3	6.5	365	Major
[illegible]ahalkada	Anuradhapura	53.0	19.0	809	Major
[illegible]athige wewa	Anuradhapura	0.6	4.3	92	Medium
[illegible] Divul Wewa	Anuradhapura			115	Medium
[illegible]agaha wewa	Anuradhapura	1.3	1.5	122	Medium
[illegible]dara Ulpotha	Anuradhapura	1.2	1.7	175	Medium
[illegible]llan kadawala	Anuradhapura	1.0	1.2	82	Medium
[illegible]kathi pothana	Anuradhapura			130	Medium
[illegible]ala wewa	Anuradhapura			45	Medium
[illegible] wewa (Huruluwewa Div)	Anuradhapura	1.3		109	Medium
[illegible] wewa (Padaviya Divi)	Anuradhapura			81	Medium
[illegible]wela Wewa	Anuradhapura	1.3	1.4	304	Medium
[illegible]kada Mahawewa	Anuradhapura			105	Medium
[illegible]lkaduwala	Anuradhapura	2.9	10.4	122	Medium
[illegible]uheddena wewa	Anuradhapura	1.0	5.5	94	Medium
[illegible]legama wewa	Anuradhapura	1.0	1.5	136	Medium
[illegible]wila Wewa	Anuradhapura	0.9	7.0	288	Medium
[illegible]wpathana wewa	Anuradhapura			173	Medium
[illegible]iya wewa	Anuradhapura	1.4		92	Medium
[illegible]kulama	Anuradhapura			81	Medium
[illegible]dalatha wewa	Anuradhapura	1.5	4.3	170	Medium
[illegible]lurugas demana	Anuradhapura	1.2	1.2	107	Medium
[illegible]llanchiya	Anuradhapura	2.7	5.5	243	Medium
[illegible] wewa	Anuradhapura			91	Medium
[illegible]dara Ratmale wewa	Anuradhapura	1.1		153	Medium
[illegible]hinda wewa	Anuradhapura	2.9	1.2	194	Medium
[illegible] gama	Anuradhapura	2.2	5.5	113	Medium
[illegible]gollewa wewa	Anuradhapura			142	Medium
[illegible]ak kulama	Anuradhapura	1.1	1.2	85	Medium
[illegible]ligollewa	Anuradhapura	1.2	5.8	100	Medium
[illegible]lewa	Anuradhapura	0.9		94	Medium
[illegible]waran kulama	Anuradhapura	1.4	4.6	151	Medium
[illegible]gollewa	Anuradhapura	0.7	1.2	108	Medium
[illegible]ll waththa wewa	Anuradhapura	1.1	1.8	211	Medium
[illegible]atiyagollewa	Anuradhapura	1.2	4.6	95	Medium
[illegible]lapattiya Divul wewa	Anuradhapura	3.1	1.8	215	Medium
[illegible]oruwa	Anuradhapura	1.3	1.2	258	Medium
[illegible]ha Bulankulama	Anuradhapura	1.6	1.5	90	Medium
[illegible]ha Halmille wewa	Anuradhapura	1.6		154	Medium

No	Reservoir Scheme	District	Capacity	Maximum Dam height	Irrigable Area	C
			MCM	m	ha	
189	Kotiyagala	Monaragala	2.6	7.0	182	M
190	Mahawewa	Monaragala	4.3	5.5	101	M
191	Saddatissa Wewa	Monaragala	1.4	8.5	172	M
192	Sugaladevi	Monaragala			304	M
193	Yudaganawa	Monaragala	1.0	6.0	182	M
194	Giritale	Polonnaruwa	23.2	23.0	3,078	Ma
195	Kaudulla	Polonnaruwa	128.3	15.0	5,063	Ma
196	Minneriya	Polonnaruwa	135.7	21.0	8,910	Ma
197	Parakrama Samudraya	Polonnaruwa	134.7	15.0	10,125	Ma
198	Bebiya wewa	Polonnaruwa	1.2	1.5	94	Me
199	Erige oya	Polonnaruwa	0.3	3.0	106	Me
200	Mahahalmiilewa wewa	Polonnaruwa			106	Me
201	Abagas wewa	Polonnaruwa				Me
202	Rota wewa	Polonnaruwa	2.6	6.7	89	Me
203	Inginimitiya	Puttlam	72.0	24.0	2,645	Ma
204	Kottu kachchiya	Puttalam	4.8	6.0	347	Ma
205	Tabbowa	Puttlam	14.8	17.0	847	Ma
206	Karavita	Puttlam	3.7	4.4	444	Me
207	Eluwan kulama	Puttalam	0.2	1.8	220	Me
208	Maha Andarawa	Puttalam	2.1	5.0	151	Me
209	Mahasen Wewa	Puttalam	4.2	5.5	365	Me
210	Pahariya	Puttalam	2.2	6.4	146	Me
211	Sengal Oya - Andana kattuwa	Puttalam			36	Me
212	Sengal Oya - Maiyawa	Puttalam	0.9	3.6	69	Me
213	Sengal Oya - Anavilundawa	Puttalam	0.5	3.3	81	Me
214	Sengal Oya - Pinkattiya	Puttalam	0.4	2.4	81	Me
215	Sengal Oya - Suruwila	Puttalam	0.7	4.0	85	Me
216	Uriyawa	Puttalam	1.0	4.3	119	Me
217	Kantale	Trincomalee	135.7	20.0	6,075	Ma
218	Mahadivulwewa	Trincomalee	20.2	16.0	563	Ma
219	Mora Wewa	Trincomalee	38.2	20.0	1,620	Ma
220	Vendrasan	Trincomalee	24.9	15.0	709	Ma
221	Wan Ela	Trincomalee	2.7	7.6	417	Me
222	Thopur	Trincomalee				Me
223	Janaranjana Wewa	Trincomalee			329	Me
224	Peramadu	Trincomalee	2.6	5.5	269	Me
225	Pavatkulam	Vavuniya	33.3	15.0	1,674	Ma
226	Irataperiya kulam	Vavuniya	4.3	6.4	209	Ma
227	Muhathan kulam	Vavuniya	3.0	5.3	313	Ma
228	Maruthamadu	Vavuniya	1.8	4.5	177	Me
229	Rajendran kulam	Vavuniya	1.0	3.0	119	Me
230	Akathimuruppu	Mannar	8.6	4.5	2,524	Ma
231	Giants Tank	Mannar	39.0	3.5		
232	Viyathikulam	Mannar	1.0	3.7		

No	Reservoir Scheme	District	Capacity	Maximum Dam height	Irrigable Area	Category
			MCM	m	ha	
127	Kekanadura	Matara	2.9	18.0	486	Major
128	Uyan Wewa	Matara	0.2	6.0	98	Medium
129	Bandagiriya	Hambantota	11.2	7.0	668	Major
130	Kekiri Obada	Hambantota	2.7			Major
131	Lunugamwehera	Hambantota	270.0	26.0	12,570	Major
132	Mahagalwewa	Hambantota	3.4	9.5	164	Major
133	Mauara	Hambantota				Major
134	Muruthawela	Hambantota	47.8	31.5	1,308	Major
135	Ridiyagama	Hambantota	26.8	22.0	2,743	Major
136	Udukiriwala	Hambantota	4.0	5.8		Major
137	Weheragala	Hambantota	75.0			Major
138	Debarawewa	Hambantota	0.9	3.0	383	Medium
139	Kirama Oya	Hambantota	0.9	2.1	2,109	Medium
140	Tissa Wewa	Hambantota	4.4	5.0	1,114	Medium
	Weerawila	Hambantota	13.0	5.2	932	Medium
	Yoda Wewa	Hambantota	9.8	5.2	1,323	Medium
	Maha Aluthgama	Hambantota			223	Medium
	Pahala Andarawewa	Hambantota	3.4	9.0	85	Medium
	Pallemattala	Hambantota	1.3	1.8	134	Medium
	Pannegamuwa	Hambantota	1.2	2.1	227	Medium
	Pattiyapola Mahawewa	Hambantota	0.7	1.5	182	Medium
	Rannuduwewa	Hambantota	0.8	1.5	81	Medium
	Dewahuwa	Matale	12.0	16.0	81	Major
	Himbiliyakada	Matale	2.3	13.4	156	Major
	Nalanda	Matale	15.3	31.0		Major
	Wemedilla	Matale	5.6	22.7	729	Major
	Wewala wewa	Matale	2.9	16.0	97	Major
	Meewelpitiya	Kandy			81	Medium
	Mahanuwara wewa	Kandy				Medium
	Mahanikakatuwa	Matale				Medium
	Kandepitawala	Matale			246	Medium
	Pahala Erawula	Matale	0.4	18.0	104	Medium
	Ambakola Wewa	Kurunegala	8.3	6.7	340	Major
	Attaragalla-	Kurunegala	5.9	7.6	420	Major
	Batalagoda	Kurunegala	6.0	16.0	2,442	Major
	Hakwatuna	Kurunegala	23.4	22.0	2,454	Major
	Maha Galgamuwa	Kurunegala	8.0	8.5	164	Major
	Kimbulwana	Kurunegala	6.8	17.0	674	Major
	Magallewa	Kurunegala	9.2	7.1		Major
	Mediyawa	Kurunegala	3.2	6.8	486	Major
	Palukadawala	Kurunegala	9.5	16.0	820	Major
	Usgala Siyambalangamuwa	Kurunegala	24.7	18.0	851	Major
	Maha Siyambalangamuwa	Kurunegala	0.3	11.0	192	Medium
	…iyama	Kurunegala			304	Medium
	Mahananeriya	Kurunegala	2.5	[illegible]	170	Medium
	…akadura	Kurunegala			304	Medium
	…agama wewa	Kurunegala			85	Medium
	…ddeketiya	Kurunegala	0.8	4.5	98	Medium
	…aru Wewa	Kurunegala	1.8	1.8	190	Medium
	…male	Monaragala	6.8	15.0	406	Major
	…lapanagala	Monaragala	7.2	16.0	405	Major
	…kandiya	Monaragala	30.3	21.0	810	Major
	…galge Wewa	Monaragala			101	Medium
	…hila Oya	Monaragala	2.3	15.0	215	Medium
	…aruwa	Monaragala	2.1	3.6	85	Medium
	…e wewa	Monaragala	1.4	5.0	93	Medium
	…a Ara	Monaragala	2.7		97	Medium
	…illa pillewa	Monaragala	1.5	1.8	107	Medium
	…gamuwa	Monaragala	4.2	2.1	273	Medium
	…kurullan Pelassa	Monaragala	0.6		101	Medium
	…iyapita	Monaragala	1.4		146	Medium
	…wila & Detagamuwa	Monaragala	5.5	3.3	162	Medium

Annex 5

Piezometer data log sheet

H- Denotes Dip meter reading

Date	Res. Water Level (m)	P1 - Top Level..........		P2 - Top Level......		P3 - Top Level.......		P4 - Top Level........		P5 - Top Level......	
		Depth H m	Level (m)(msl)	Depth H m	Level (m)(msl)	Depth H m	Level (m)(msl)	Depth H m	Level (m)(msl)	Depth H m	Level (m)(msl)

Seasonal Inspection Report on Condition of Headworks

At month_____ of _____

_____ Range

No	Name of the Scheme	Defects observed at Head Works	Proposed Remedial action
1			
2			
3			
4			
5			
6			

Data Log sheet - V- Notches

Annex 6

h : denotes height of weter level read from gauges in V notches

Date	Res. Water Level	V1	V2	V3	V4	V5	V6
		h (mm)	h (mm)	h (mm)	h (mm)	h (mm)	h (mm)